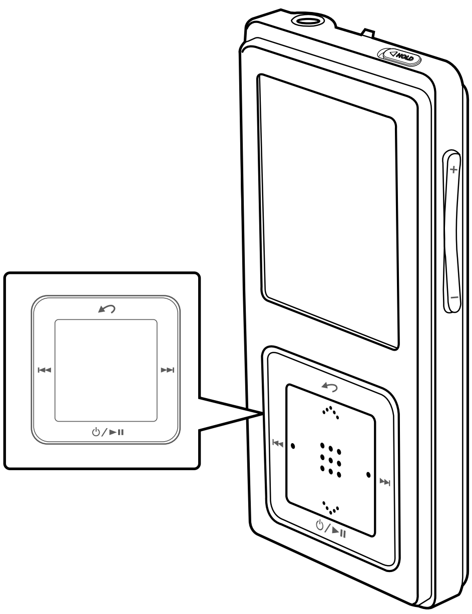
PORTABLE DIGITAL AUDIO PLAYER

Basic Model : YP-Z5F

* Application : YP-Z5F ZB/ZS/ZW/ZP [1GB]
YP-Z5F QB/QS/QW/QP [2GB]
YP-Z5F AB/AS/AW/AP [4GB]

SERVICE *Manual*

PORTABLE DIGITAL AUDIO PLAYER



Model : YP-Z5F

Features

- MP3,WMA, Secure WMA Playback
- MTP Device
- Image Viewer
- Color TFT LCD
- DNSe Surround Sound
- USB 2.0 High Speed Data Transfer
- Built-in Rechargeable Li-polymer Battery
- Beep on/off
- Upgradable Firmware
- FM Tuner

- Confidential -

SAMSUNG

ELECTRONICS

Printed in Korea
Code no. AH68-01819G

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Ch14 Basic Information of MP3

1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced.

2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including control knobs and compartment covers.

3. Make sure that there are no cabinet openings through which people--particularly children--might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.

4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of the unit. Example: Do not add auxiliary audio or video connectors. Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.

5. Leakage Current Hot Check (Figure 1-1):
   Warning: Do not use an isolation transformer during this test. Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, *Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).

   With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, etc.) and all exposed metal parts. Examples: Handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat.

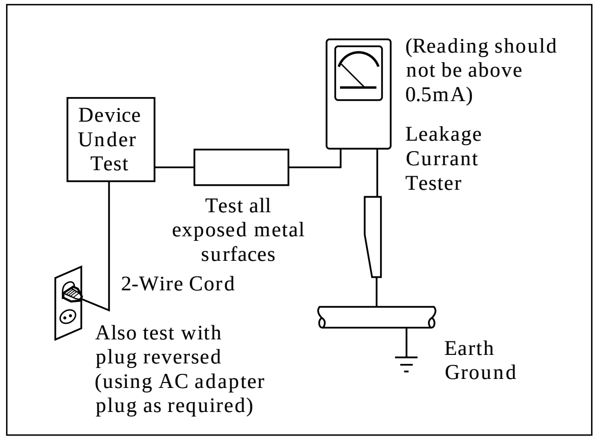


Fig. 1-1 AC Leakage Test

6. Insulation Resistance Cold Check:
   (1) With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. (2) Set the power switch to ON. (3) Measure the resistance between the shorted AC plug and any exposed metallic parts. Example: Screwheads, antenna, control shafts or handle brackets.

   If any of the exposed metallic parts has a return path to the chassis, the measured resistance should be between 1 and 5.2 megohms. If there is no return path, the measured resistance should be "infinite." If the resistance is outside these limits, a shock hazard might exist. See Figure 1-2

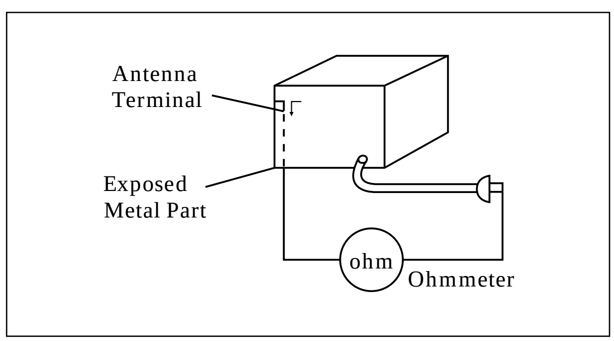


Fig. 1-2 Insulation Resistance Test

1-1 Safety Precautions (Continued)

7. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards

8. Observe the original lead dress, especially near the following areas: Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that no wires or components touch thermally hot parts.

9. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original--even if the replacement is rated for higher voltage, wattage, etc.

10 Components that are critical for safety are indicated in the circuit diagram by shading, ⚠ or ⚠ . Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

1-2 Servicing Precautions

Warning1: First read the "Safety Precautions" section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

1. Servicing precautions are printed on the cabinet. Follow them.

2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) Remove or reinstall any component or assembly, (b) Disconnect an electrical plug or connector, (c) Connect a test component in parallel with an electrolytic capacitor.

3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring may be clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.

4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.

5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).

6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.

7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor ("solid state") devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.

2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power--this is an electric shock precaution.)

3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.

4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.

5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.

6. Use only an anti-static solder removal device. Many solder removal devices are not rated as "anti-static" (these can accumulate sufficient electrical charge to damage ESDs).

7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.

8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

9. Minimize body motions when handing unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4 Special Precautions and Warning Labels for Laser Products

(UL)

This Product Complies with DHHS Rules 21CFR, Sub chapter J.At date of Manu-facture

(CSA)

CERTIFIED ONLY TO CANADIAN ELECTRICAL CODE.

CERTIFIE EN VERTU DU CODE CANADIAN DE LELETRICITE SEULEMENT

(UL,CSA,EU)

CLASS 1
LASER PRODUCT

Fig. 1-3 Warning Labels (Location: Enclosure Block)

(UL,CSA,SCAN)

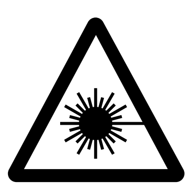
CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATEO AVOIDEXPOSURE TO BEAM

ADVARSEL: USYNLIG LASERSTRÅLING VED ABNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSAETTELSE FOR STRALING

VARO:AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTINA NAKYMATTÖMALLE LASERSATEILYLLE ALA KATSO SATEESEEN!

VARNING:OSYNLIG LASERSTRÅLNING NAR DENNA DEL AR OPPNAD OCH SPARREN AR URKOPPLAD BETRAKTA EJSTRÅLEN!

(EU)



UL : Manufactured for U.S.A. Market.
CSA : Manufactured for Canadian Market.
EU : Manufactured for European Market.
SCAN : Manufactured for Scandinavian Market.

Fig. 1-4 Warning Labels (Location: Disc Clamper, Inner Side of Unit Door or Nearby Unit Chassis)

1-4 Special Precautions and Warning Labels for Laser Products (Continued)

1-4-1 Warnings

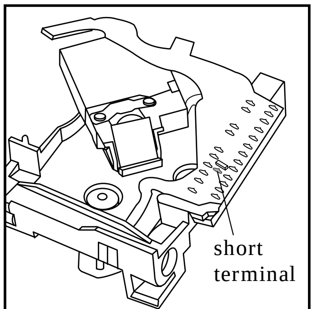
1. When servicing, do not approach the LASER exit with the eye too closely. In case it is
necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30 cm from the surface of the objective lens on the optical pick-up block.

2. Do not attempt to handle the objective lens when the DISC is not on the tray.

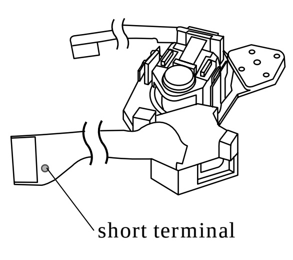
1-4-2 Laser Diode Specifications

Material: GaAs+ GaAlAs
Wavelength: 760-800 nm
Emission Duration: Continuous

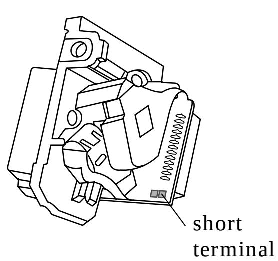
Laser Output: 0.2 mw (measured at a 1.6 mm distance from the objective lens surface on the optical pick-up block.)



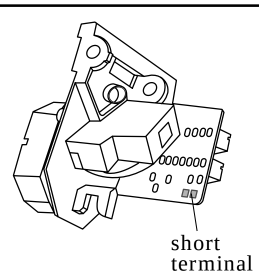
SOH91VI(LDP)



SOH91CI(CAR,walkman)



SOH-A1
(CMS-V10,CMS-V30)



SOH94T4N
(CMS-V10,CMS-V30)

1-4-3 Handling the Optical Pick-up

1. Static electricity from clothing or the body may cause electrostatic breakdown of the laser diode in the Optical Pickup. Follow this procedure:

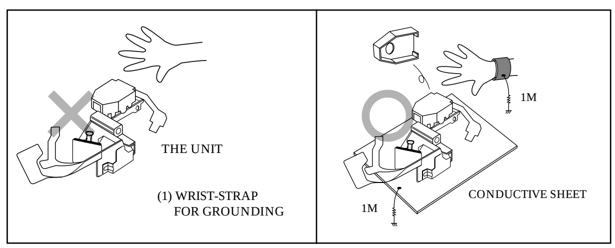
2. Place a conductive sheet on the work bench (i.e., the black sheet used for wrapping repair parts.) Note: The surface of the work bench should be covered by a copper ground plane, which is grounded.

3. The repair technician must wear a wrist strap which is grounded to the copper sheet.

4. To remove the Optical Pickup block:
Place the set on the conductive sheet, and momentarily touch the conductive sheet with both hands. (While working, do not allow any electrostatic sources--such as clothes--to touch the unit.)

5. Ground the "Short Terminal" (located on the PCB, inside the Pickup Assembly) before replacing the Pickup. This terminal should be shorted whenever the Pickup Assembly is lifted or moved.

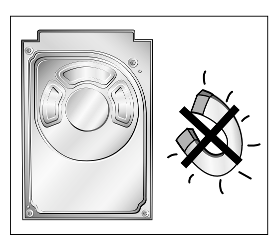
6. After replacing the Pickup, reopen the Short
See diagrams below:



1-5 Special Precautions for HDD

* HDD Data Maintenance Step
1. Since the data on the HDD is weak to mechanical shock, place the HDD in a safe location that is free from mechanical shock once it is removed from the main unit.

2. In order to safe keep the data on the HDD, back up the data before the repair or make sure not to place the HDD near any electrical appliance that generates a strong magnetic field.



2. Product Descriptions

1. Product Feature

Concept

Premium Stylish Slim Design Flash Jukebox Playing Reminiscence

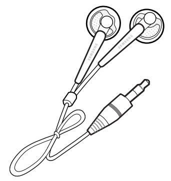
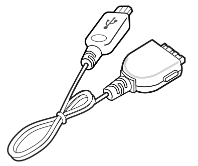
Specifications

1. Memory Capacity : 2GB, 4GB
2. LCD : 1.82" 65,000 Colors
3. Play Time : 38 Hours
4. Slim Size : 11.4mm Thickness
5. SNR : 92dB
6. Supported File Formats
   : MP3, WMA, Secure WMP
7. Supported Image Formats : JPEG
8. Battery Capacity : 820mAh
9. Interface : Windows XP USB 2.0
10. MTP Mode Dedicated Device

Model Name			YP-Z5
Power		-	3.7V (Li-Polymer Rechargeable)
Built-in Battery Power		mAh	820mAh
File	Compatibility	-	AUDIO: MPEG1/2/2.5 Layer3(8kbps~320kbps, 8kHz~48kHz), MPEG1 Layer2(32kbps~384kbps, 32kHz, 44.1kHz, 48kHz), WMA(8kbps~192kbps,8kHz~44.1kHz) IMAGE: JPEG(ISO/IEC 10918-1/Annex F-Sequential DCT-based mode of operation)
Earphone Output		mW	22 (16Ω)
Output Frequency Range		-	20Hz~20KHz
Noise Ratio		dB	92 with 20kHz LPF(based on 1KHz 0 dB)
Play Time		-	35 hours of music play
File Transmission Speed		Mbps	Max 40
Temperature Range for Operation		°C	5~35 (23~95°F)
Case		-	Aluminum
Weight		oz	1.98 (inc. battery)
Dimension (WxHxD)		inches	2GB : 1.66 X 3.54 X 0.45 4GB : 1.66 X 3.54 X 0.48

● The contents of this Manual are subject to change without prior notice for further improvement.

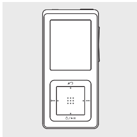
3. Accessories (options)

Accessories	Name	Code No.
	Earphone	**AH30-00086D (WHITE)** **AH30-00087D (BLACK)**
	USB cable	**AH39-00783B**

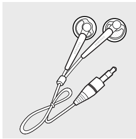
3. Product Functions

1. Basic Functions

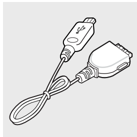
Checking the Accessories



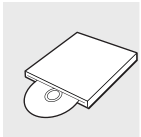
Player



Earphones



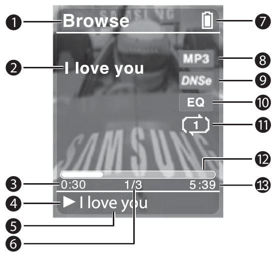
USB Cable



Easy Start CD

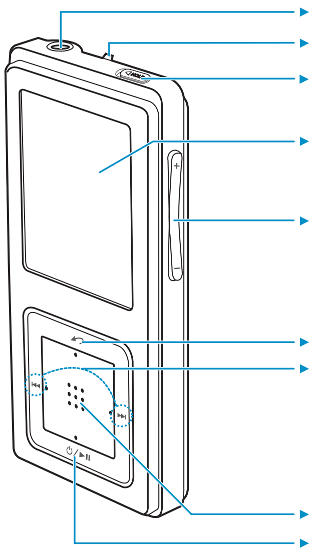
n Design of accessories is subject to change for the purpose of improvement, without notice.

Screen Display Information

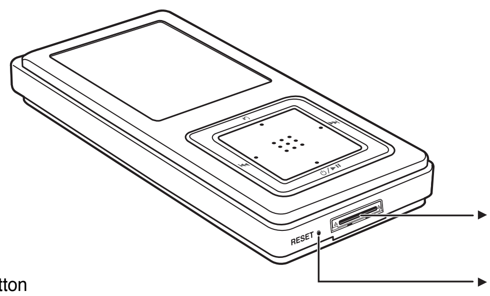


1	Current Time Display	**8**	Play/Pause/Stop Display
2	Album Title Display	**9**	Music Title Display
3	Album Display	**10**	Street Mode Display
4	3D Sound Displays	**11**	Repeat Play Display
5	File Type Display (MP3, WMA etc)	**12**	Total Play Time Display
6	Play Status Bar	**13**	Current Music Number/ Total Number Display
7	Play Time Display		

Components



- Earphone Connection Port
- Neck String Hole
- Lock Switch
- Screen Display
- Volume Control Button
- Back Button
- Move Track/Quick Search Button
- Touch Pad/Select Button
- Power & Play/Pause Button



- Power/USB Connection Port
- Reset Button

Button Functions

Buttons	Functions and Use
⏻/▷II	Long press for power off **Short press** for power on & Play/Pause
↶	**Long press** to move to the Menu screen **Short press** to move to the previous screen
I◁◁	**Long press** to scan to a point on the current track. **Short press** to move to the previous track or to play the current track from the start
I◁◁	**Long press** to scan to a point on the current track. **Short press** to move to the next track
◁ HOLD	**Push in the direction of the arrow to lock the button functions**
RESET ◎	**Press with a pointed object to reset.**

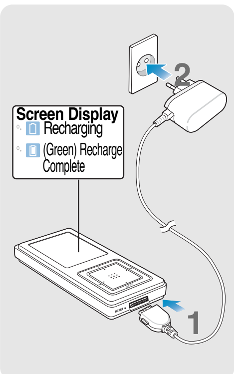
Buttons	Functions and Use
	Moving up, down, left and right and Function Selection **Tap on the top or bottom side** to move up or down by one selection. **Tap on the left or right side** to move left or right by one selection (Picture mode). **Touch lightly and slide up or down** to move up or downward. **Touch lightly and slide left or right** to move to the left or right (Picture mode). **Touch lightly and slide up, down, left or right while a photo is magnified** to move to your desired position. **Press the center of the Touchpad** to select the function and move to the next screen.

CAUTION

- Do not use any sharp object other than your fingers to operate the touchpad. Otherwise, touchpad may be damaged.

Charging the battery

Fully charge the battery before using the player for the first time or when the it has not been used for a while.



1 **Connect the USB cable to the USB port (ψ) on your PC.**

2 **Connect the other end of the USB cable to the Power/USB Connection Port on bottom of the player.**

ßô<CONNECTED> appears on the screen display of the player.

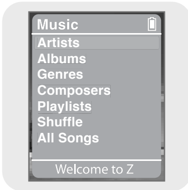
ßô When connected with the USB cable, it takes about 4 hours for a full charge although this may vary depending on the PC environment.

Battery Use

- Recharge and store within the temperature range of 5°C~35°C(40°F~95°F).
- Do not overcharge (longer than 12 hours). Excessive charging or discharging may shorten the battery's life.
- Battery life naturally shortens slowly over time as it is a consumable item.

Basic Use

Turning the Power On & Off



Turning the Power On Press the [⏻/▶II] button.

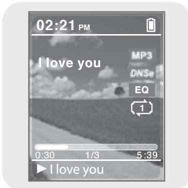
- To turn the Power On.

Turning the Power Off

Press and hold the [⏻/▶II] button

- Power is turned off.
- Power is automatically turned off when none of the buttons have been pressed for a preset period of time (Default: 1 minute) in the pause mode.

Playing Music



1 **Press and hold the [↶] button to move to the Menu screen.**

2 **Touch the [Touch Pad] and slide up to select <Music>, then press the [Touch Pad].**

- The Music Menu will appear.

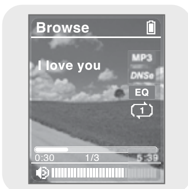
3 **Touch the [Touch Pad] and slide up or down to select a music file of your choice.**

4 **Touch the Touchpad and the Music file will begin playing.**

NOTE

- Press the [↶] button to move to the previous screen.
- Press and hold the [↶] button to move to the Menu screen.

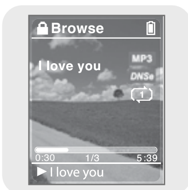
Volume Control



Press the [+ , -] button on the side of the unit.

- The Volume Status Bar will appear.
- Press the + button to increase the volume or the – button to decrease it.

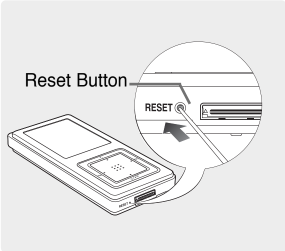
Lock Function



1 **Push the [HOLD] button on the top of the unit in the direction of the arrow.**

2 **Push the [HOLD] button in the opposite direction of the arrow to release the Lock function.**

Reset Function



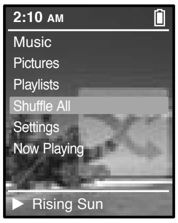
If a product malfunction occurs, you can re-initialize the system by pressing the Reset button.

PC Requirements

For use in conjunction with a PC, the following is required:

- **Pentium 300MHz or higher**
- **Windows XP Service Pack 1 or higher**
- **100MB of free hard disc space**
- **CD Rom Drive (2X or higher)**
- **USB Port 2.0 only**
- **DirectX 9.0 or higher**
- **Windows Media Player 10.0 or higher**

Shuffle Play All Music



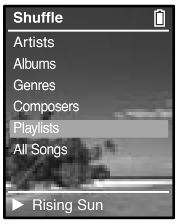
1 **Press and hold the [↶] button to move to the Menu screen.**

2 **Touch the [Touch Pad] and slide up or down to select <Shuffle All>, then press the [Touch Pad].**
- Music files will appear.

3 **Touch the [Touch Pad] and slide up or down to select a music file to play, then press the [Touch Pad].**
- The file selected, then all music files contained on the player will start playing in random order.

Shuffle Play by Type

E.g. Shuffle Play by Artist



Shuffle Menu
- <Artists> : To play by artist
- <Albums> : To play by album
- <Genres> : To play by genre
- <Composers> : To play by composer
- <Playlists> : To play by Playlist
- <Shuffle> : To play continuously at random
- <All Songs> : To play in numeric or alphabetical order

1 **Press and hold the [↶] button to move to the Menu screen.**

2 **Touch the [Touch Pad] and slide up or down to select <Music>, then press the [Touch Pad].**
- The Music Menu will appear.

3 **Touch the [Touch Pad] and slide up or down to select <Shuffle>, then press the [Touch Pad].**
- The Shuffle Menu will appear.

4 **Touch the [Touch Pad] and slide up or down to select <Artists>, then press the [Touch Pad].**
- Artist list will appear.

5 **Touch the [Touch Pad] and slide up or down to select an artist, then press the [Touch Pad].**
- The music files for the selected artist will appear in random order.

6 **Touch the [Touch Pad] and slide up or down to select a music file to play, then press the [Touch Pad].**
- The music files under that particular <Artist> will start playing continuously in random order.

Checking the Music Information

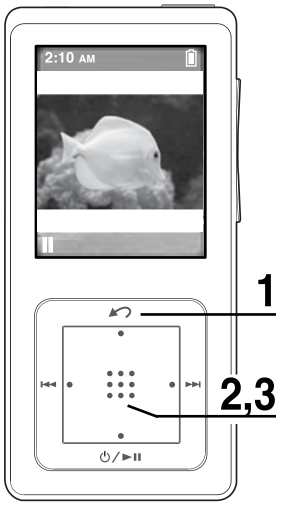


1 **Press and hold the [↶] button to move to the Menu screen.**

2 **Touch the [Touch Pad] and slide up or down to select <Now Playing>, then press the [Touch Pad].**
- The music information screen for the track currently playing will appear.

Picture Viewing

Picture Viewing



1 **Press and hold the [↶] button to move to the Menu screen.**

2 **Touch the [Touch Pad] and slide up or down to select <Pictures>, then press the [Touch Pad].**

- The Picture Folder list will appear.
  Touch the [Touch Pad] and slide up or down to select a folder, then press the [Touch Pad] to display the pictures.

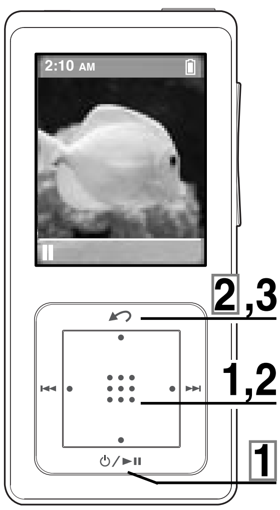
3 **Touch the [Touch Pad] and slide up or down to select the picture file of your choice, then press the [Touch Pad].**

- The selected file will appear.
- Large pictures may take longer to display.

NOTE
- Press the [I◀◀▶▶I] button while viewing a picture to display the previous or next picture.
- Press and hold the [Touch Pad] button while viewing a picture to make it the background of the player.

Photo Viewing

Picture Enlarging/Slideshow Viewing



Picture Enlarging

1 **Press the [Touch Pad] in the Picture Viewing mode.**

- The picture will be gradually enlarged each time the [Touch Pad] is pressed.

2 **Touch the [Touch Pad] and slide up or down to move around the enlarged picture.**

- You can move to the area of your choice.

3 **Press the [↶] button to cancel the enlargement.**

- The picture will be gradually downsized each time the [↶] button is pressed.

Slideshow Viewing

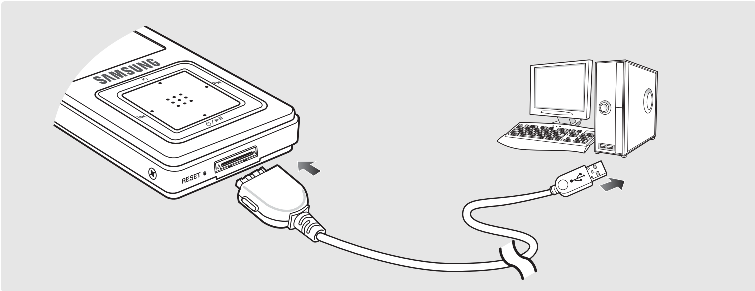
1 **Press the [⏻/▶II] button in Picture List or Picture Viewing mode.**

- The slideshow will start.

2 **Press the [↶] button to stop the slideshow.**

NOTE
- Please refer to P34 for set the Start Time or interval of the Slideshow.

Before you start! Use the USB Cable provided when connecting the product to a PC.



1 **Connect the USB cable to the USB port ( ) on your PC.**

2 **Connect the other end of the USB cable to the Power/USB Connection Port on bottom of the player.**

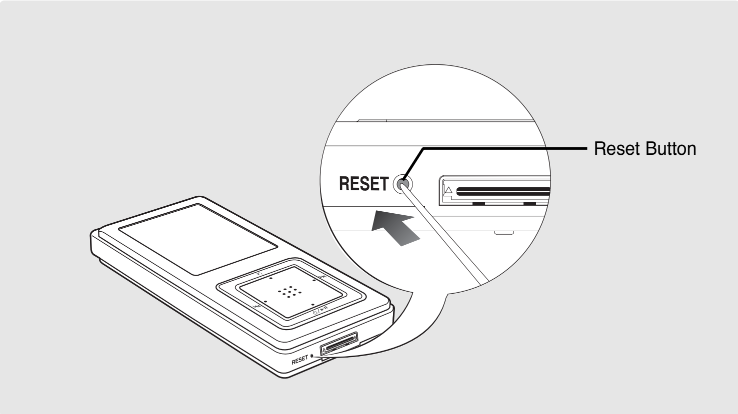
- <CONNECTED> appears on the screen display of the player.

4. Adjustments

4-1.How to reset the device

System Reset

If a product malfunction occurs,you can re-initialize the system by pressing the Reset button.



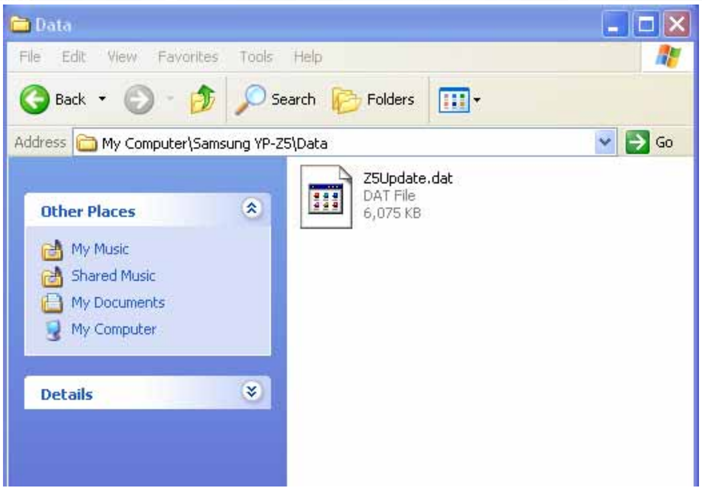
Press the Reset Button at the bottom of the product with a pointed object such as a safety clip.

- The system will be initialized.
- The Reset function will not delete data stored in the built-in memory.

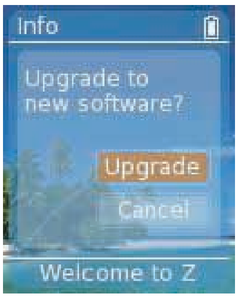
1. YP-Z5 PC CONNECT



2. Transfer Z5Update.dat file on the Data folder of MTP connection



3. Disconnect the USB cable. Then the following screen will come up. Select Upgrade to initiate firmware upgrade. This will power off the system.



4. After Power on the system again, the left screen will come up. This can take 1 minute or so. Wait until this screen is disappeared.



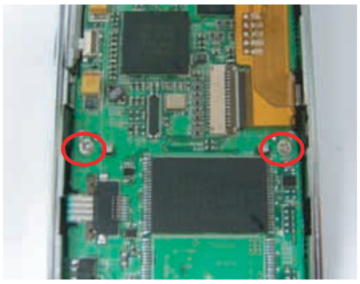
This image maybe will be changed

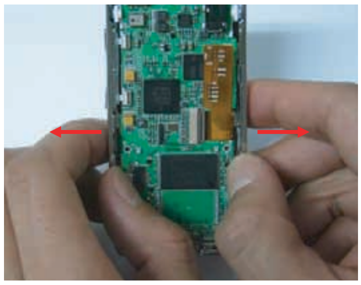
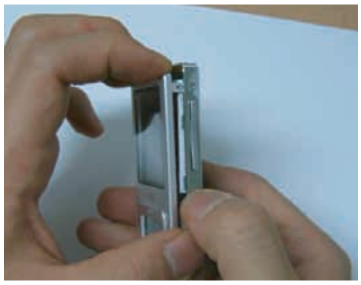
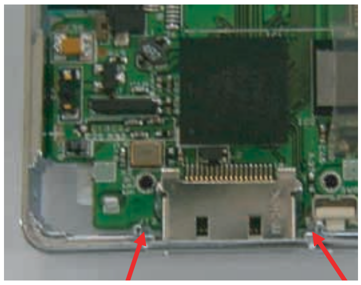
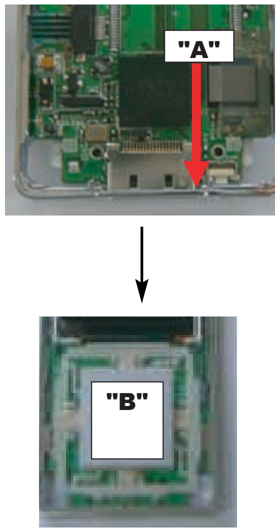
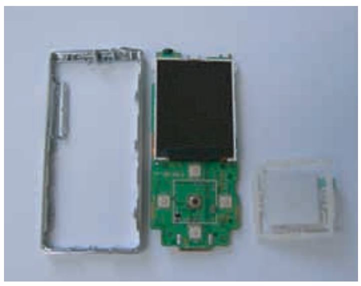
5. Now firmware is upgraded. Power on the system and check the version information in the Settigns > System Info > Version tab.

5. How to disassemble

* CAUTIONS

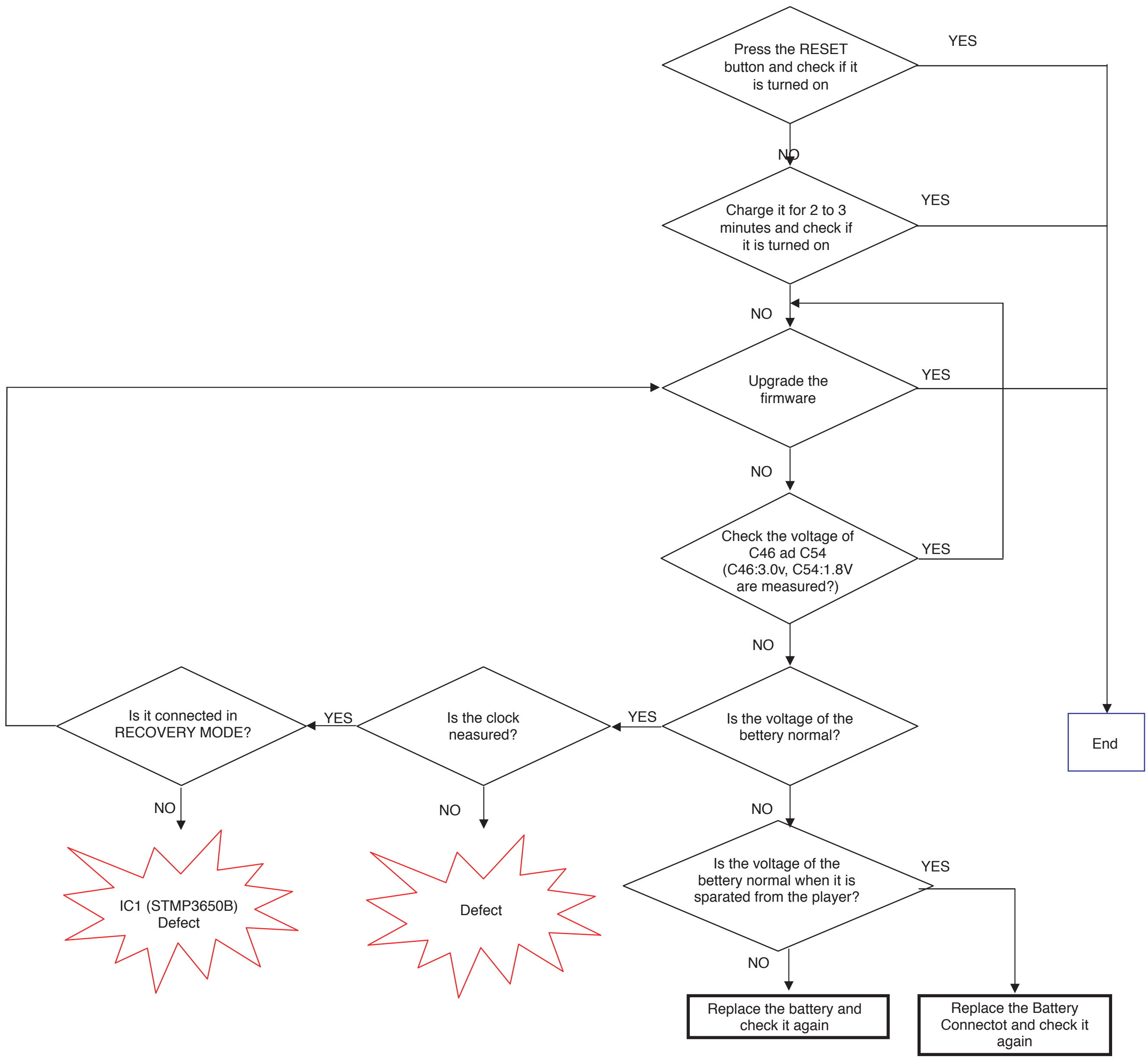
1. To avoid damage to the product, follow the disassembly method in the Service Manual.
2. As some Semiconductor devices are very sensitive to static,
   ensure that all procedures are adhered to when handling ESD's.

Order(Description)	Picture
1. Remove the 4 screws from the both sides of the player.	
2. Separate the Cabinet-bottom with tweezers.	
3. Separate the battery from the connector and separate the Holder-Earphone, Deco] Hanger and Holder-USB in the lower part.	
4. Picture after the disassembly.	
5. Remove the 2 screws fixing the PCB.	

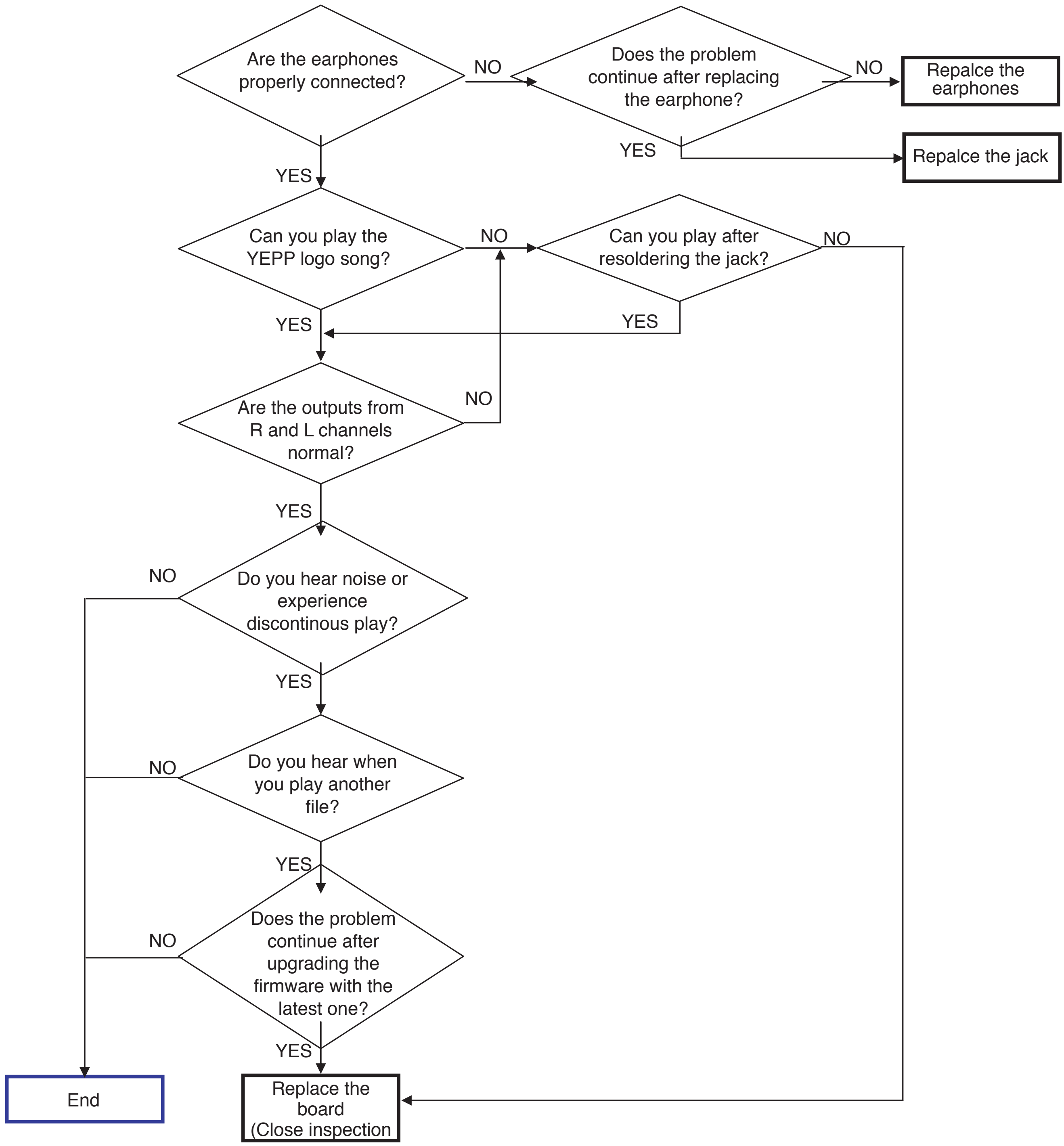
Order(Description)	Picture
6. Open both of the sides of the Cabinet-Middle slightly so that the hooks are released.	
7. Separate the Front Assy as the following figure shows.	
8. Separate the PCB by releasing the hooks marked by the arrow in the figure with tweezers.	
9. Slide the "A" part in the direction of the arrow and slide the "B" on the front to separate the PCB-Main.	
10. Picture after the completion of the disassembly	

6. Troubleshooting

1. Power Failure

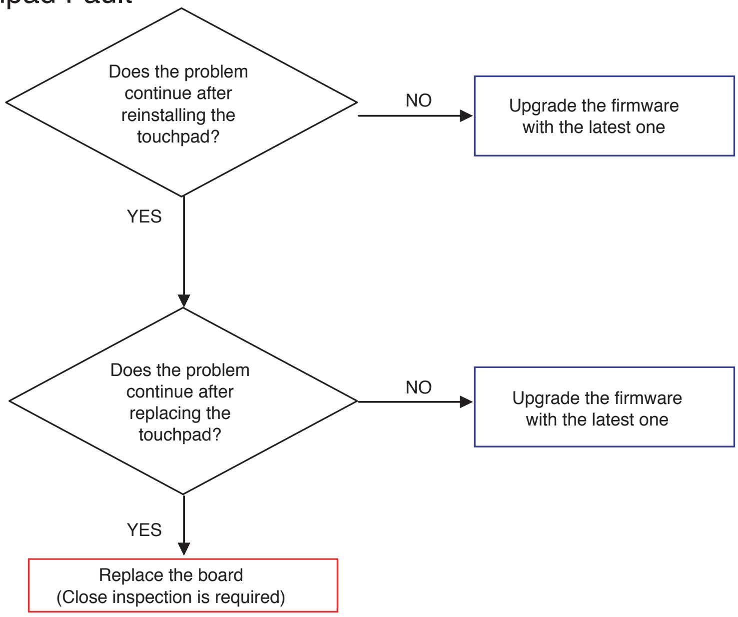


2. No Sound

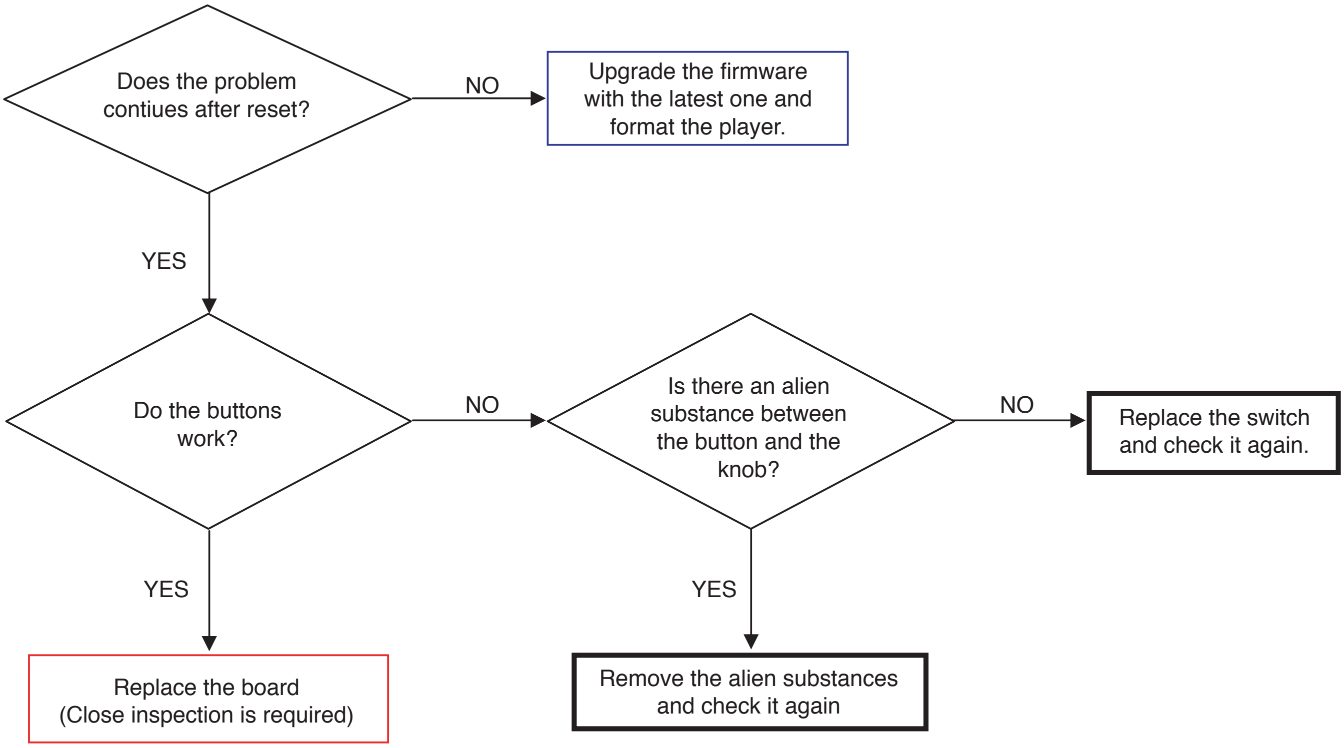


Are the earphones properly connected?
NO
Does the problem continue after replacing the earphone?
NO
Repalce the earphones
YES
Repalce the jack
YES
Can you play the YEPP logo song?
NO
Can you play after resoldering the jack?
NO
YES
YES
Are the outputs from R and L channels normal?
NO
YES
Do you hear noise or experience discontinous play?
NO
YES
Do you hear when you play another file?
NO
YES
Does the problem continue after upgrading the firmware with the latest one?
NO
YES
End
Replace the board (Close inspection

3. Touchpad Fault

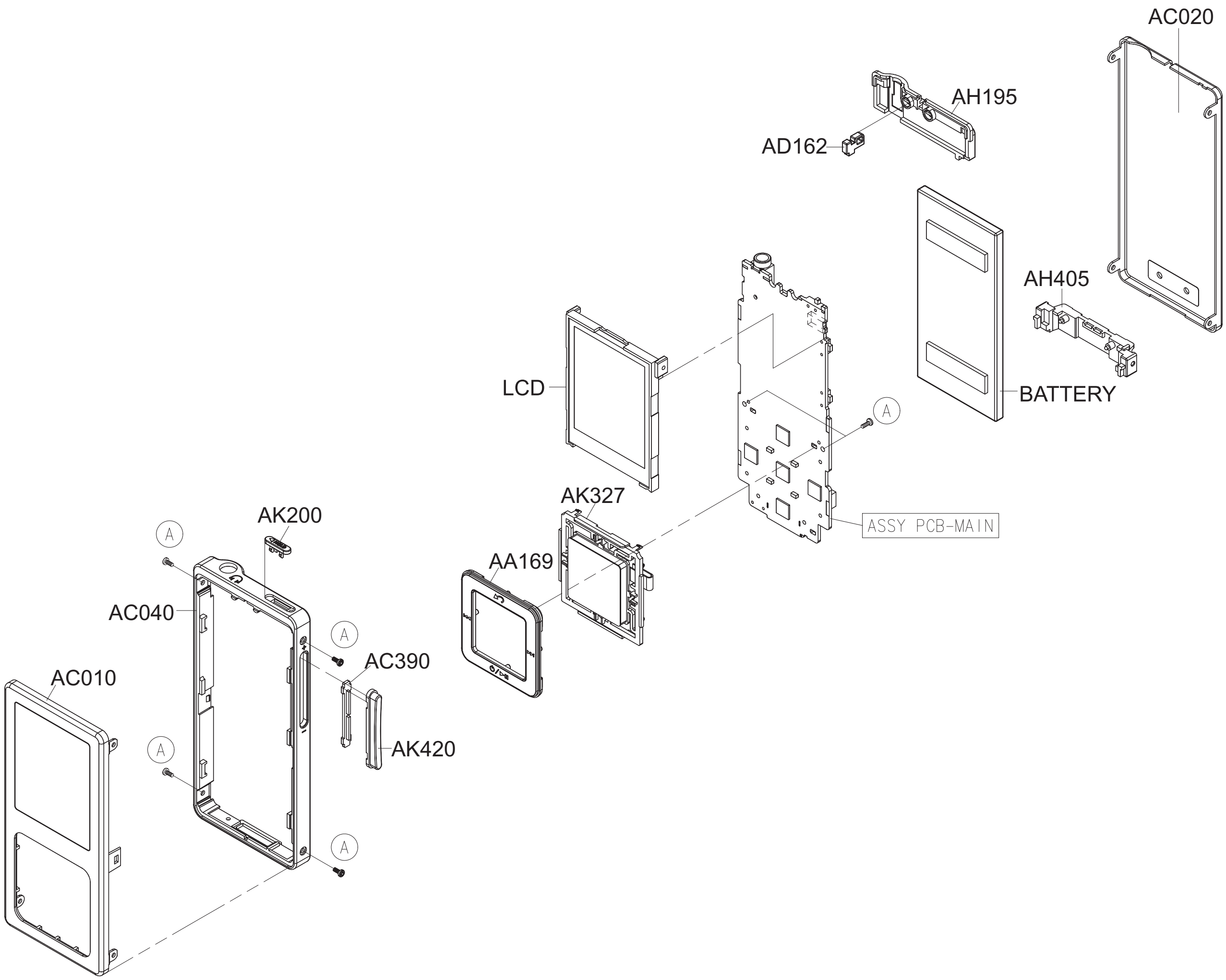


4. Button Fault



7.Exploded View & Parts List

1. Total Exploded View



2. Parts List

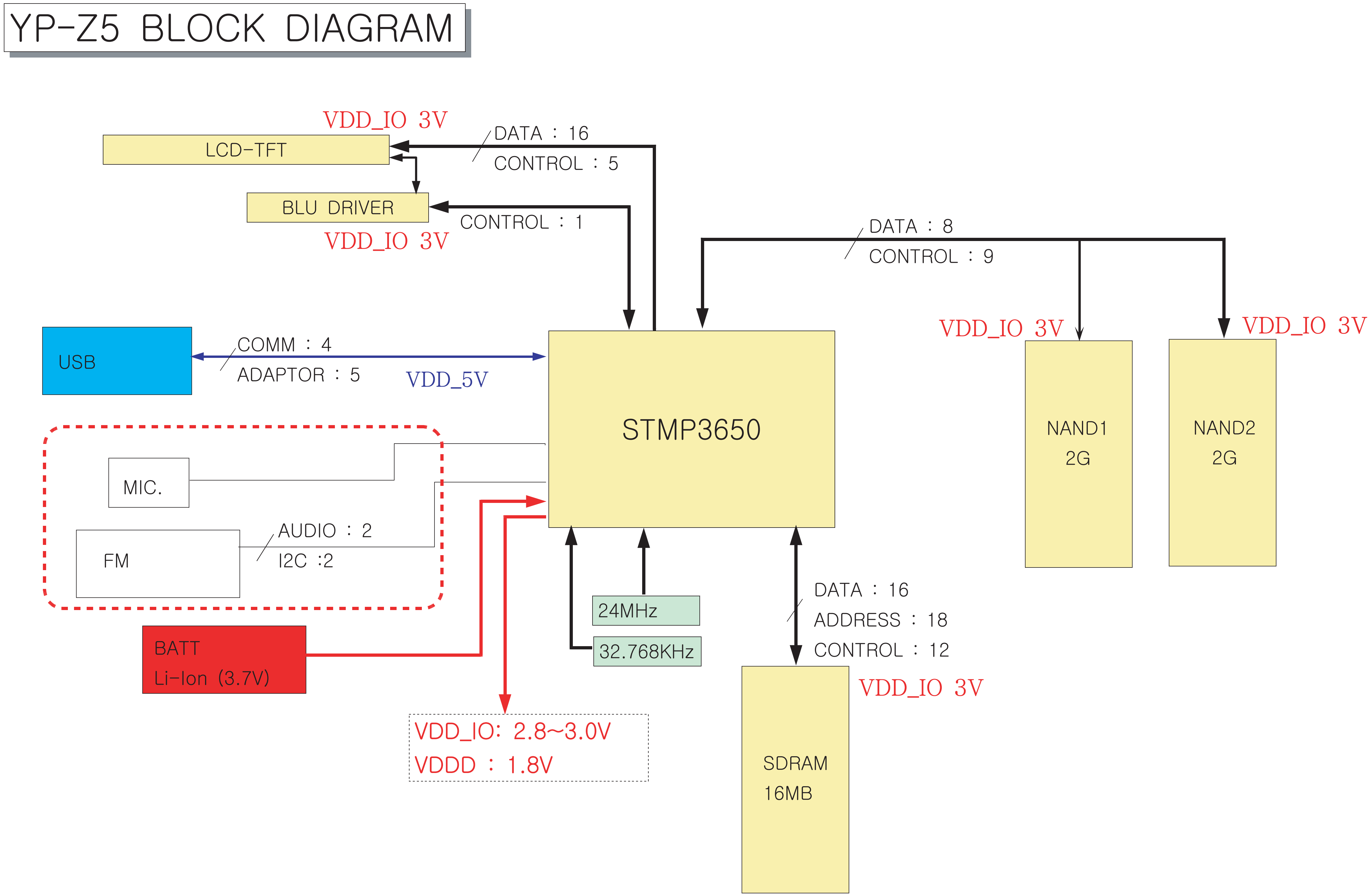
Location No	Part No.	Description	Specification	Q'ty	REMARK	SNA
AA161	AH97-01663A	ASSY KNOB-VOL	RUBBER+VOLUME	1		
AA169	AH97-01600A	ASSY KNOB-PLAY	COVER+RUBBER+HOLDER	1	SILVER	
AA169	AH97-01600B	ASSY KNOB-PLAY	COVER+RUBBER+HOLDER	1	BLACK	
AC010	AH64-03732B	CABINET-FRONT	AL+PC	1	YEPP, SILVER	
AC010	AH64-03732C	CABINET-FRONT	AL+PC	1	SAMSUNG,SILVER	
AC010	AH64-03732E	CABINET-FRONT	AL+PC	1	SAMSUNG, BLACK	
AC010	AH64-03732G	CABINET-FRONT	AL+PC	1	SAMSUNG, PINK	
AC010	AH64-03732H	CABINET-FRONT	AL+PC	1	YEPP, WHITE	
AC010	AH64-03732J	CABINET-FRONT	AL+PC	1	YEPP, PINK	
AC020	AH64-03733B	CABINET-BOTTOM	AL 0.6T	1	1GB/2GB SILVER	
AC020	AH64-03733C	CABINET-BOTTOM	AL 0.6T	1	1GB/2GB BLACK	
AC020	AH64-03734D	CABINET-BOTTOM	AL 0.6T	1	1GB/2GB WHITE	
AC020	AH64-03735E	CABINET-BOTTOM	AL 0.6T	1	1GB/2GB PINK	
AC020	AH64-03748B	CABINET-BOTTOM	AL 0.6T	1	4GB SILVER	
AC020	AH64-03748C	CABINET-BOTTOM	AL 0.6T	1	4GB BLACK	
AC020	AH64-03748D	CABINET-BOTTOM	AL 0.6T	1	4GB WHITE	
AC020	AH64-03748E	CABINET-BOTTOM	AL 0.6T	1	4GB PINK	
AC040	AH64-03734B	CABINET-MIDDLE	ABS Cr Plating	1		
AC390	AH63-01099A	RUBBER-VOLUME	Silicon	1		
AD162	AH64-03736A	DECO-HANGER	Zn Diecating Plating	1		
AH195	AH61-02064B	HOLDER-EARPHONE	ABS Cr Plating	1	W/O MIC	
AH195	AH61-02065B	HOLDER-EARPHONE,M	ABS Cr Plating	1	W/MIC	
AH405	AH61-02066A	HOLDER-USB	PC BLK	1		
AK200	AH64-03738A	KNOB-HOLD	ABS Plating	1		
AK327	AH64-03982A	KNOB-SELECT	PC	1		
AK420	AH64-03739B	KNOB-VOLUME	ABS Plating	1		
BATTERY	4301-001195	BATTERY	3.7V, Li-Polymer	1		
LCD	AH07-00179A	ASSY-LCD	1.82, LTE182QQ-F03-0	1		
A	6003-001166	SCREW TAP-TITE	M1.4, L4 Ni PLT	6		

8. Electrical Parts List

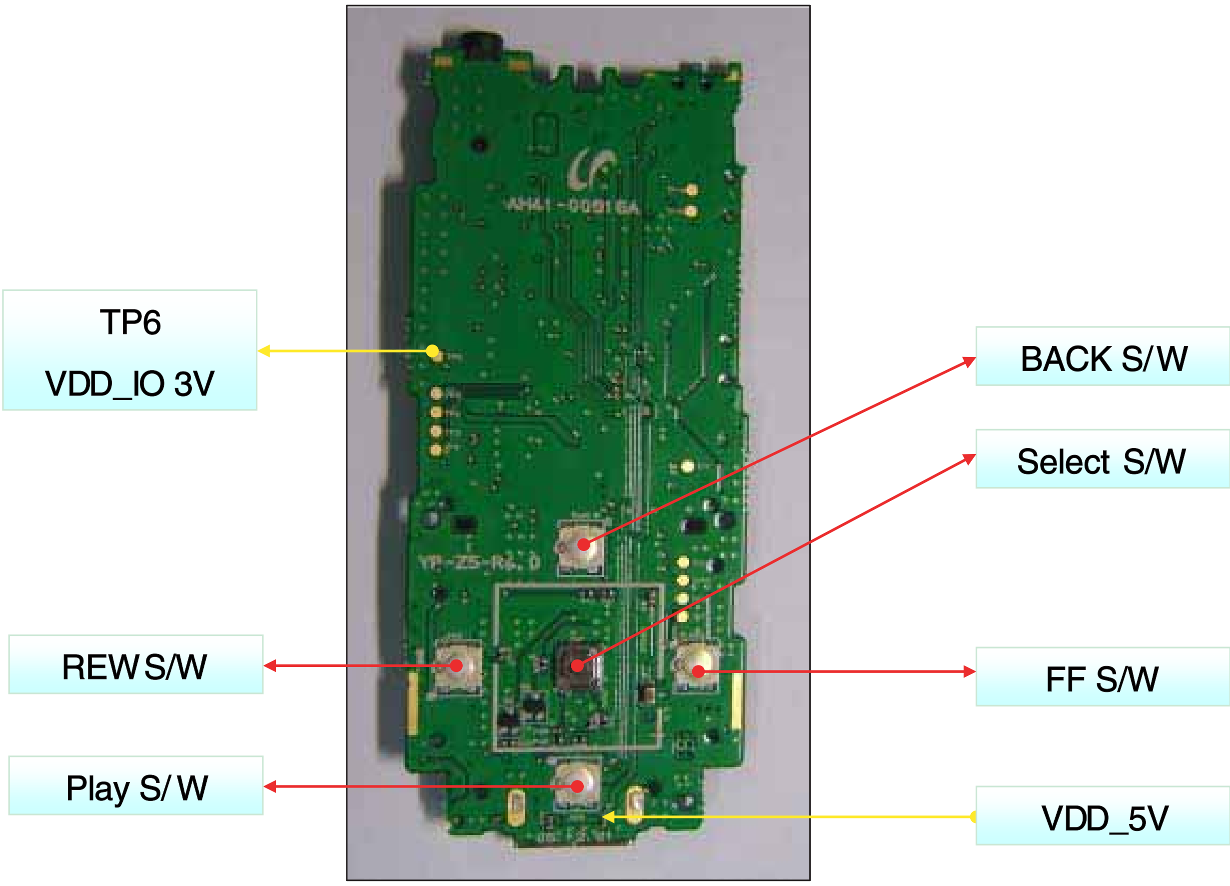
***** YP-Z5F Parts List *****

Location no.	Code no.	Description & Specification	Remarks
C10	2404-001407	C-TA,CHIP;330uF,20%,2.5V,-,REEL,3528	
C11	2203-001405	C-CER,CHIP;22nF,+80-20%,25V,Y5V,1005	
C14	2203-002709	C-CER,CHIP;100nF,+80-20%,16V,Y5V,1005	
C16	2203-001201	C-CER,CHIP;0.0070nF,0.5pF,50V,NP0,1005	
C17	2203-005900	C-CER,CHIP;1000NF,+80-20%,10V,Y5V,1005	
C2	2404-001401	C-TA,CHIP;220uF,+-20,4V,SMD,REEL,3216	
C20	2203-006093	C-CER,CHIP;1000nF,+80-20%,6.3V,Y5V,1005	
C25	2203-000330	C-CER,CHIP;0.012nF,5%,50V,C0G,1005	
C26	2203-000254	C-CER,CHIP;10nF,10%,16V,X7R,1005	
C3	2007-001325	R-CHIP;3.3Kohm,5%,1/16W,TP,1005	
C4	2203-002717	C-CER,CHIP;10nF,+80-20%,50V,Y5V,1005	
C46	2404-001348	C-TA,CHIP;100UF,20%,6.3V,-,TP,3.2X1.6X1.	
C54	2203-006090	C-CER,CHIP;10000nF,10%,6.3V,X5R,2012	
C6	2404-001064	C-TA,CHIP;10UF,20%,6.3V,WT,TP,2012	
C70	2203-000585	C-CER,CHIP;0.22nF,10%,50V,X7R,1005	
FM1	AH40-00119A	TUNER-NOMAL;TT-502X,YP-U2,FM,-,-,-,50,-,	
FU1	3601-001408	FUSE-SURFACE MOUNT;32V DC,0.2A,Fast-Acti	
IC1	0902-001904	IC-MICROPROCESSOR;STMP3660,24MHz,FPBGA,1	
IC2	1105-001668	IC-DRAM;K4M281633,4x2Mx16Bit,FBGA,54P,	
IC3	1107-001609	IC-FLASH MEMORY;K9K8G08U0M,8Gbit,1Gx8Bit	YP-Z5FZ Series
IC3	1107-001598	IC-FLASH MEMORY;K9HAG08U1M,16Gbit,2Gx8Bit	YP-Z5FQ Series
IC3	1107-001599	IC-FLASH MEMORY;K9MBG08U5M,32Gbit,4Gx8Bi	YP-Z5FA Series
IC9	1203-003708	IC-DC/DC CONVERTER;AAT3151,DFN,12P,3x3mm	
J1	3722-002247	JACK-EAR PHONE;4P,-,BRASS,BLK,-	
J10	3708-001971	CONNECTOR-FPC/FFC/PIC;31P,0.3mm,SMD-A,AU	
J12	3710-002208	CONNECTOR-INTERFACE;18P,1R,0.5mm,ANGLE,N	
J3	3710-001436	SOCKET-BOARD TO BOARD;2P,1R,1.27mm,SMD-A	
J4	3708-002155	CONNECTOR-FPC/FFC/PIC;8P,0.5MM,SMD-A,SN-	
L1	2703-002653	INDUCTOR-SMD;4.7UH,20%,2828	
L2	2901-001302	FILTER-EMI SMD;20V,0.3A,-,-,2.0x1.2x1.3m	
L3	3301-001345	BEAD-SMD;600ohm,2012,300mA,TP,679ohm/11	
L5	3301-001105	BEAD-SMD;1.6x0.8x0.8mm,-,-	
L7	3301-001659	BEAD-SMD;600ohm,1005,300mA,TP,,744ohm/2	
M1	3003-001108	MIC-CONDENSOR;5.5V,0.100~0.350 mA,-22 dB	
Q1	0505-001426	FET-SILICON;IRLML6401,P,-12V,-4.3A,0.05o	
Q2	0504-001048	TR-DIGITAL;-,NPN,100mW,47K,SC-70,TP	
Q9	0505-001893	FET-SILICON;Si1024X,N,20V,515mA,0.7ohm,0	
R10	2007-000147	R-CHIP;8.2Kohm,5%,1/16W,TP,1005	
R106	2007-000157	R-CHIP;47Kohm,5%,1/16W,TP,1005	
R11	2007-000138	R-CHIP;100ohm,5%,1/16W,TP,1005	
R12	2007-000143	R-CHIP;4.7Kohm,5%,1/16W,TP,1005	
R13	2007-000148	R-CHIP;10Kohm,5%,1/16W,TP,1005	
R17	2007-000161	R-CHIP;82KOHM,5%,1/16W,TP,1005	
R2	2007-000140	R-CHIP;1Kohm,5%,1/16W,TP,1005	
R20	2007-000171	R-CHIP;0ohm,5%,1/16W,TP,1005	
R23	2007-000162	R-CHIP;100Kohm,5%,1/16W,TP,1005	
R29	2007-000137	R-CHIP;2KOHM,5%,1/16W,TP,1005	
R31	2007-000242	R-CHIP;1.5KOHM,5%,1/16W,TP,1005	
R32	2007-007456	R-CHIP;619ohm,1%,1/16W,TP,1005	
R4	2007-000173	R-CHIP;22ohm,5%,1/16W,TP,1005	
R41	2007-000163	R-CHIP;120Kohm,5%,1/16W,TP,1005	
R50	2007-000141	R-CHIP;2.2Kohm,5%,1/16W,TP,1005	
R78	2007-003006	R-CHIP;16OHM,5%,1/16W,DA,TP,1005	
R9	2007-007156	R-CHIP;1ohm,5%,1/16W,TP,1005	
R92	2007-007014	R-CHIP;51KOHM,5%,1/16W,TP,1005	
SW1	3404-001180	SWITCH-TACT;12V DC,50mA,260gf,5.2x5.2x1.	
SW2	3404-001121	SWITCH-TACT;12V DC,50mA,160gf,4.8x4.8x0.	
SW4	3408-001038	SWITCH-SLIDE;4V,300mA,SPST,ON-ON,-	
SW6	3404-001152	SWITCH-TACT;12V DC,20mA,160gf,4.5x4.0x2.	
TD1	1405-001121	VARISTOR;14V,10A,1X0.5X0.6MM,TP	
X1	2801-003856	CRYSTAL-SMD;0.032768MHz,20ppm,28-ACP,7pF	
X2	2801-004285	CRYSTAL-SMD;24MHz,30ppm,28-ACO,12pF,70oh	
	AH61-02065B	HOLDER-EARPHONE,M;YP-Z5,ABS,-,-,-,-,Cr P	
	AH63-01097B	COVER-TOUCHPAD;YP-Z5,PC,0.4,-,-,-,-,BLK,	
	AH63-00974F	SHEET-IC;YP-T8,PC 1.2T,-,-,-,-,-	
	AH63-01152B	SHEET-BOTTOM;YP-Z5,DOUBLE TAPE,-,-,-,-,-	
	AH97-01645A	ASSY-MID;ASS'Y,YP-Z5,-	
	AH07-00179A	LCD-TFT;LTE182QQ-F03,YP-Z5,-,34.5x49.0	
	AH64-03744A	KEY-TOUCH;YP-Z5,FILM,20x20 mm,-,-,-,Touc	
	AH67-00394A	CAP-CUSHION;YP-Z5,PS,0.7,-,-,-,-	

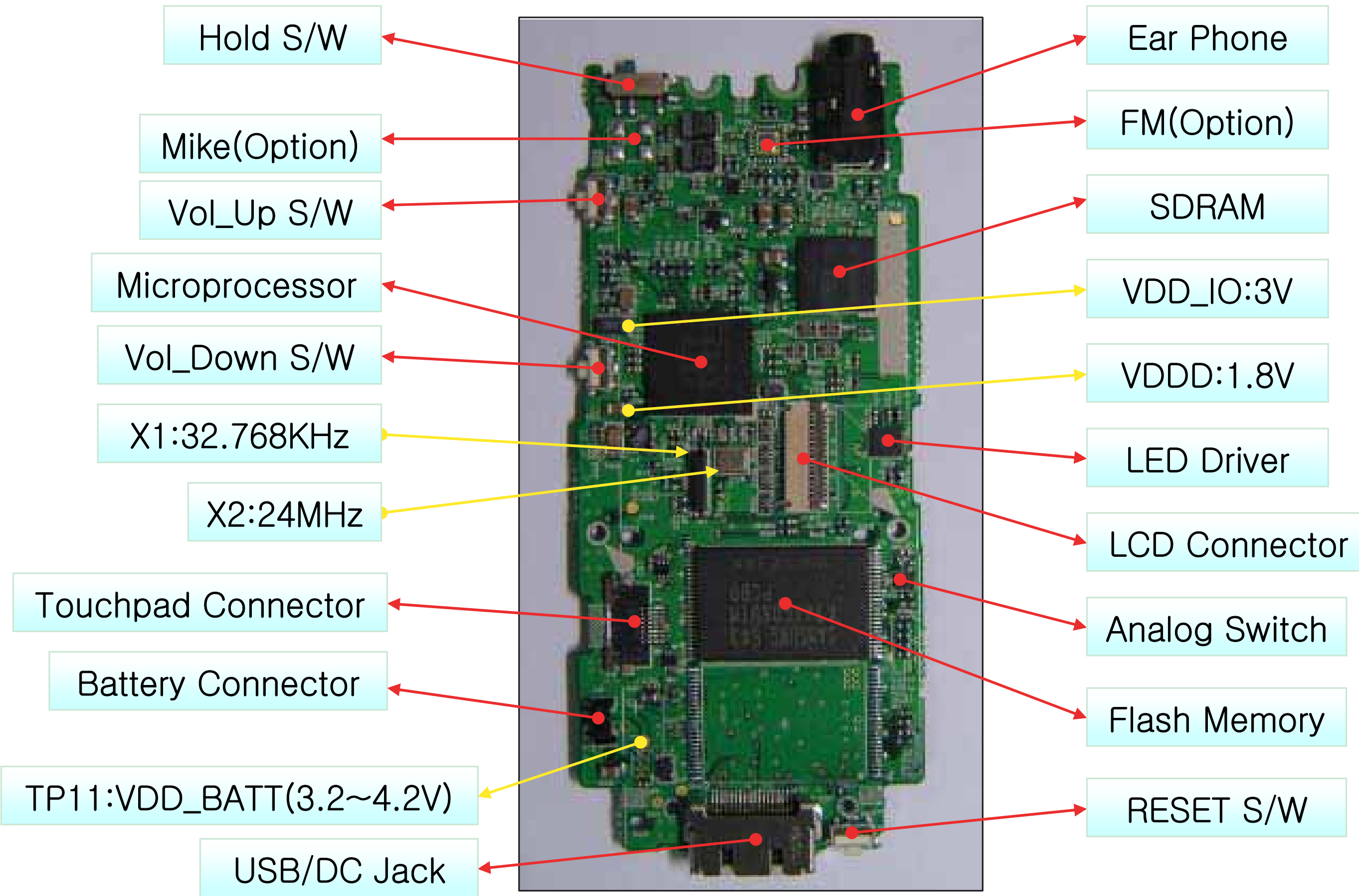
Location no.	Code no.	Description & Specification	Remarks
	AH92-02471D	ASSY PCB-YP-Z5Z-FM;YP-Z5,-	YP-Z5FZ Series
	AH92-02471E	ASSY PCB-YP-Z5Q-FM;YP-Z5,-	YP-Z5FQ Series
	AH92-02471F	ASSY PCB-YP-Z5A-FM;YP-Z5,-	YP-Z5FA Series


YP-Z5 BLOCK DIAGRAM
VDD_IO 3V
DATA : 16
CONTROL : 5
LCD-TFT
BLU DRIVER
CONTROL : 1
VDD_IO 3V
DATA : 8
CONTROL : 9
VDD_IO 3V
VDD_IO 3V
USB
COMM : 4
ADAPTOR : 5
VDD_5V
STMP3650
NAND1
2G
NAND2
2G
MIC.
FM
AUDIO : 2
I2C :2
24MHz
32.768KHz
DATA : 16
ADDRESS : 18
CONTROL : 12
BATT
Li-Ion (3.7V)
VDD_IO 3V
VDD_IO: 2.8~3.0V
VDDD : 1.8V
SDRAM
16MB

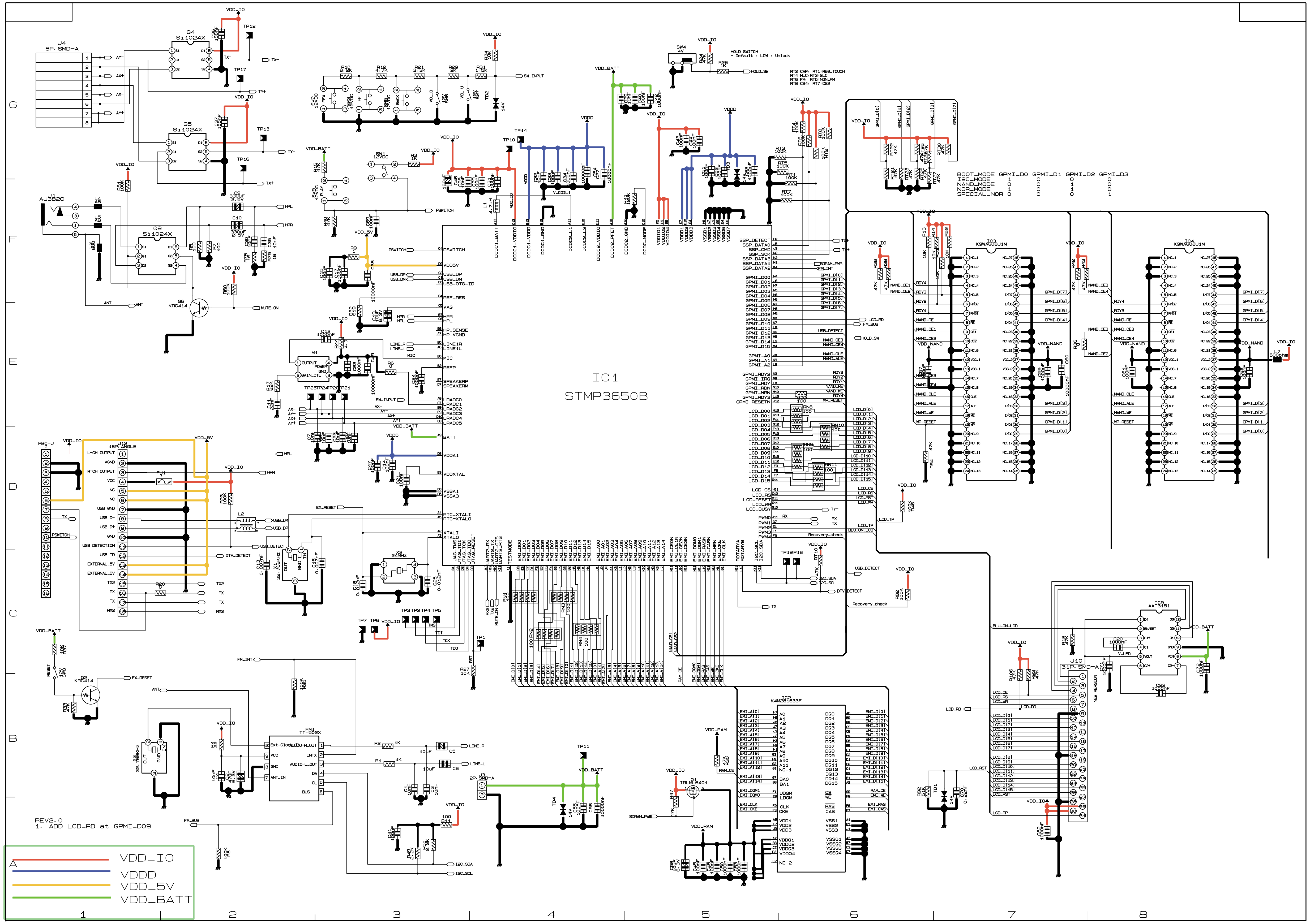
*** TOP View**



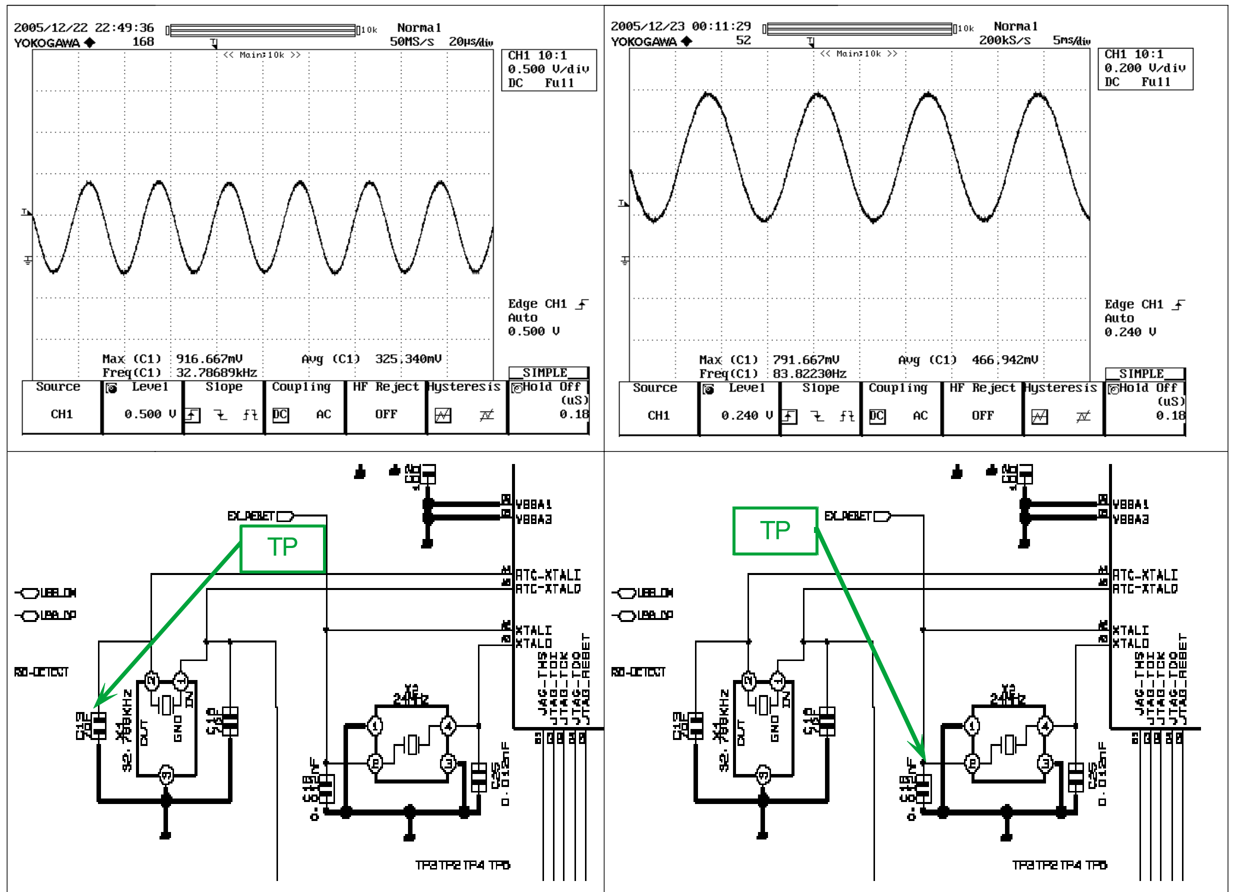
*** Bottom View**



1-1. MAIN

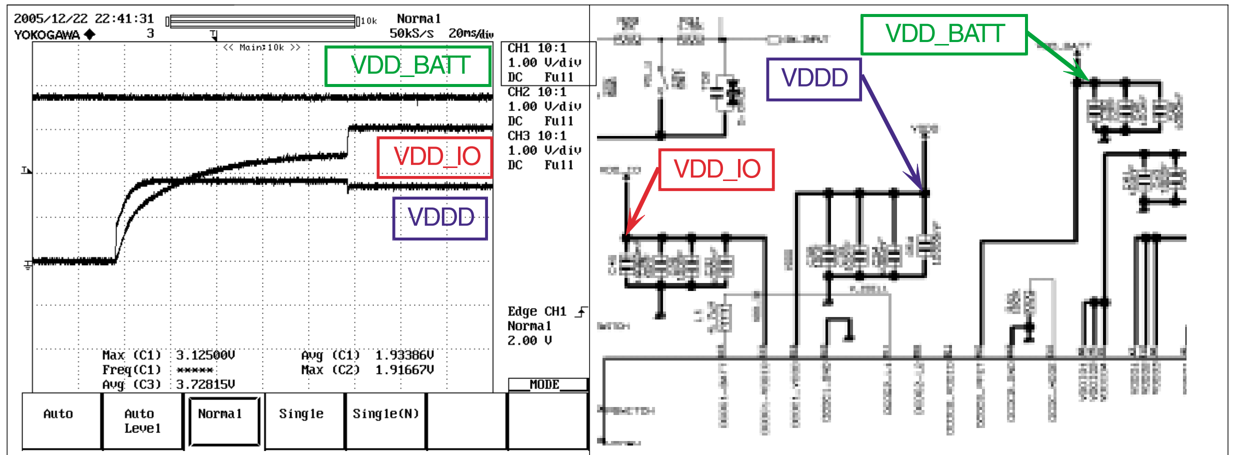


1. X-TAL Test Point.



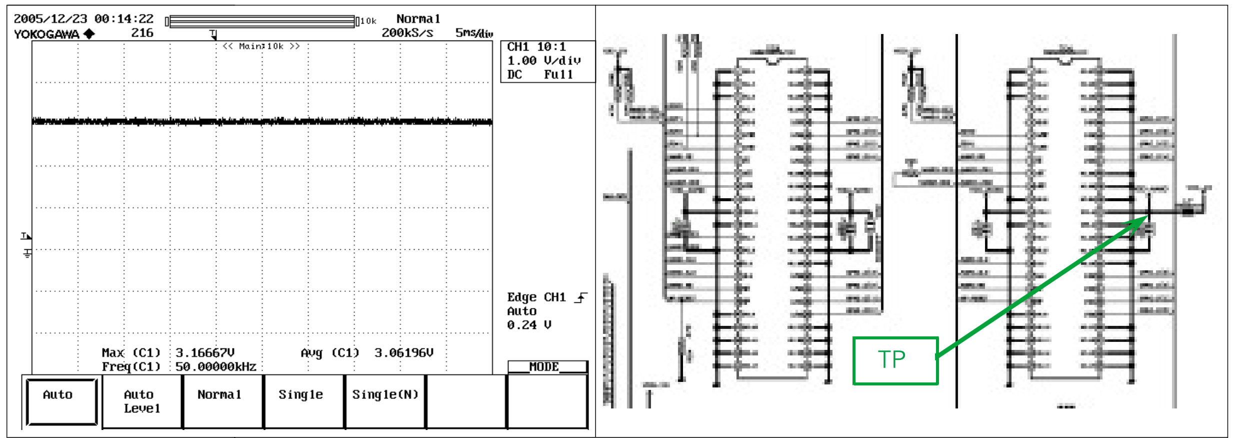
Test Point	C13	Test Point	C18
Output	X1-32.768KHz	결 과	X2-83Hz (S/W)

2. Microprocessor



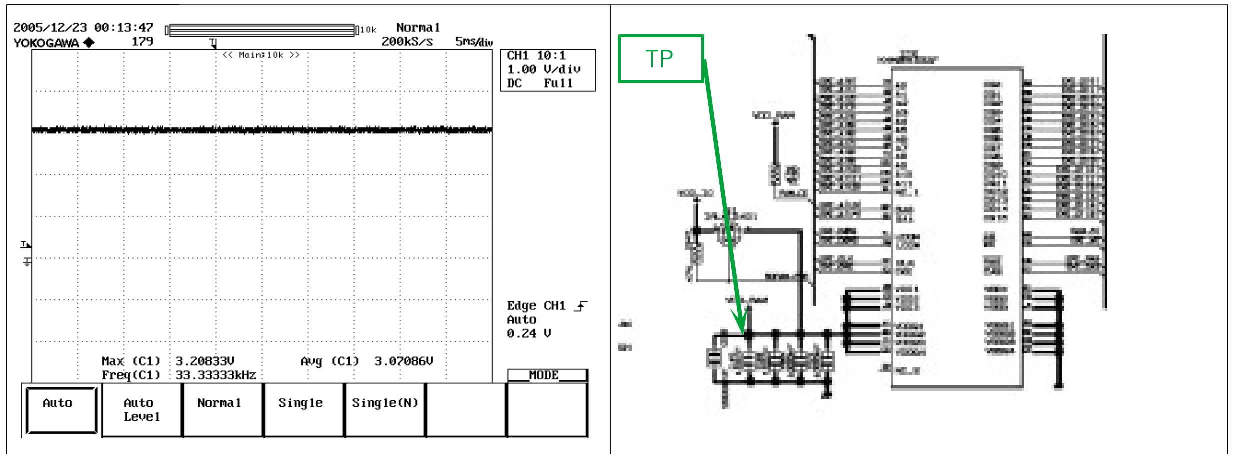
Test Point	VDD_BATT-C39, VDD_IO-C46, VDDD-C54
Output	VDD_BATT : 3.8V, VDD_IO-3.0V, VDDD-1.8V

3. Nand Flash Memory



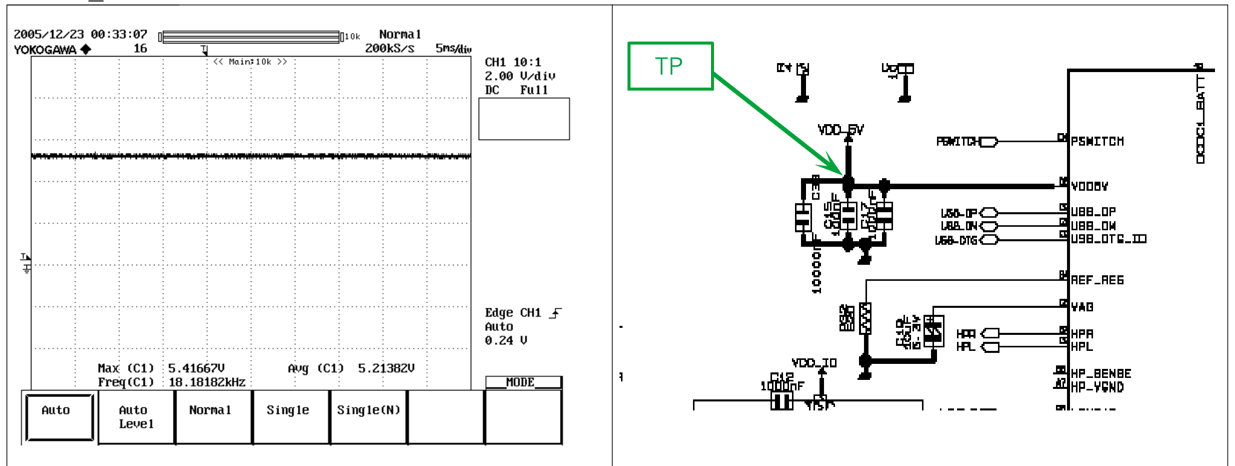
Test Point	VDD_NAND - L7
Output	VDD_NAND - 3V

4. SDRAM



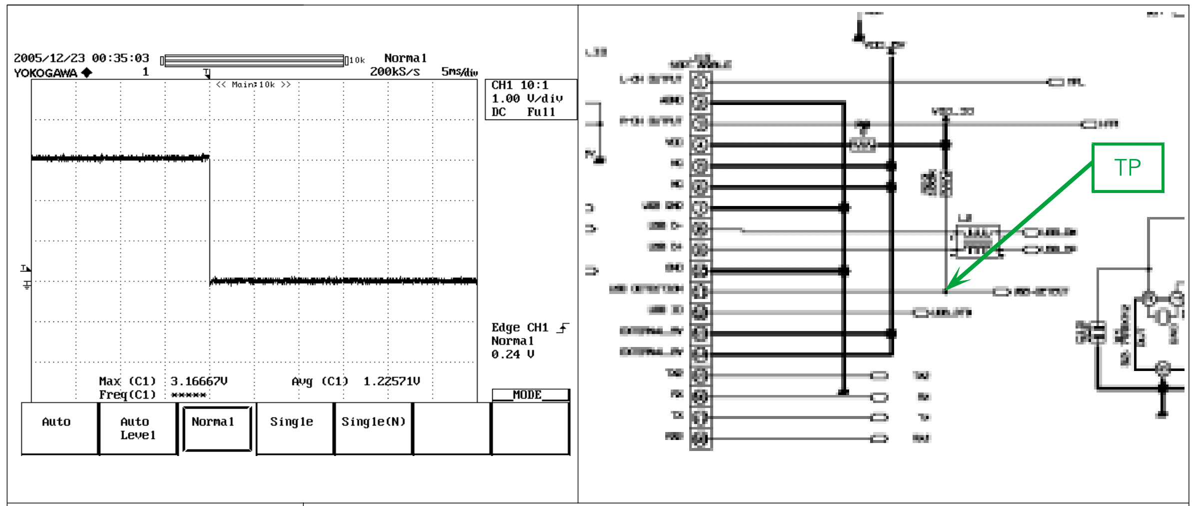
Test Point	VDD_RAM-C45
Output	VDD_RAM-3V

5. VDD_5V



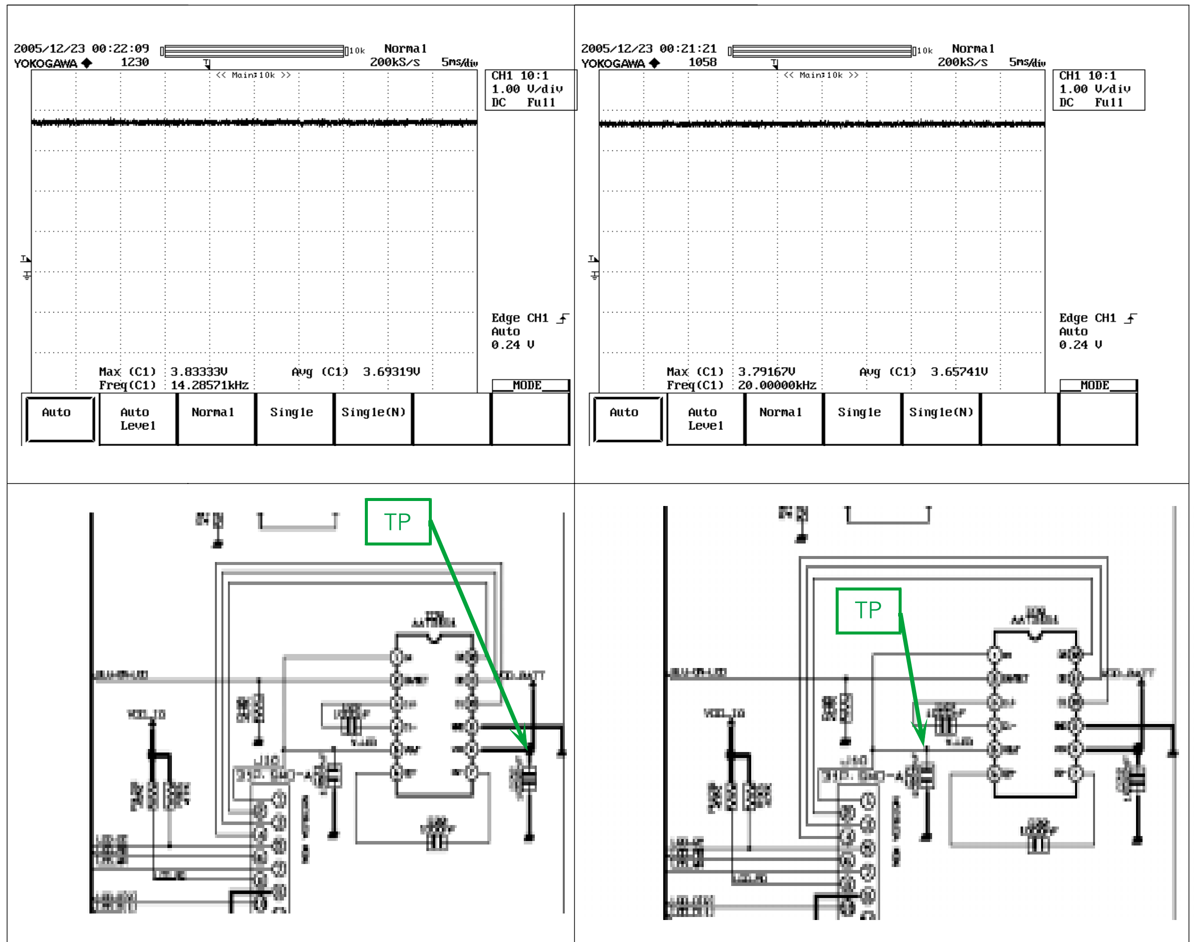
Test Point	VDD_5V-C15
Output	VDD_5V-5V

6. USB_DETECT



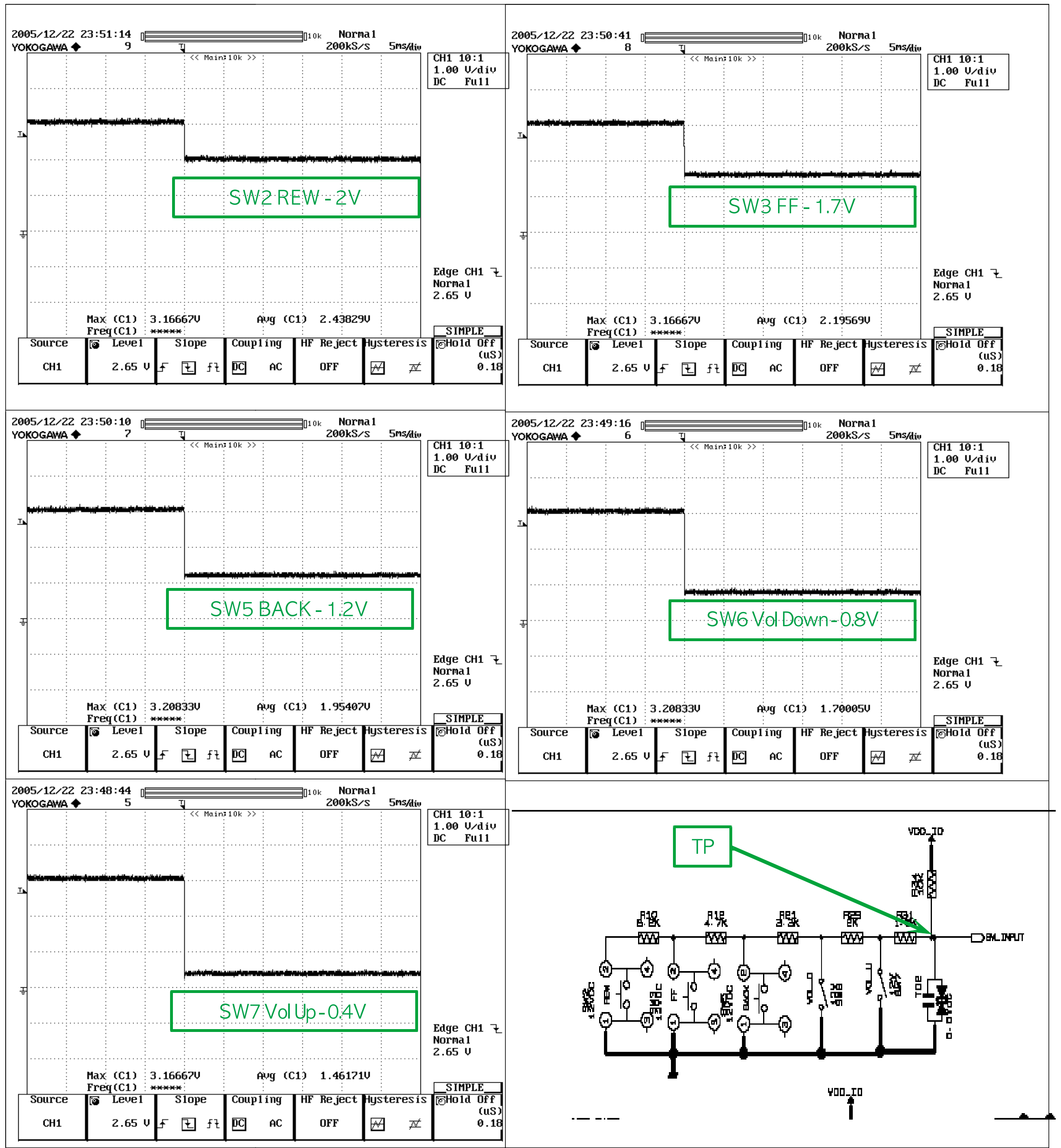
Test Point	USB_DETECT-R23
Output	USB_DETECT : USB연결시 3V → 0 V

7. LED_Deiver(IC9)



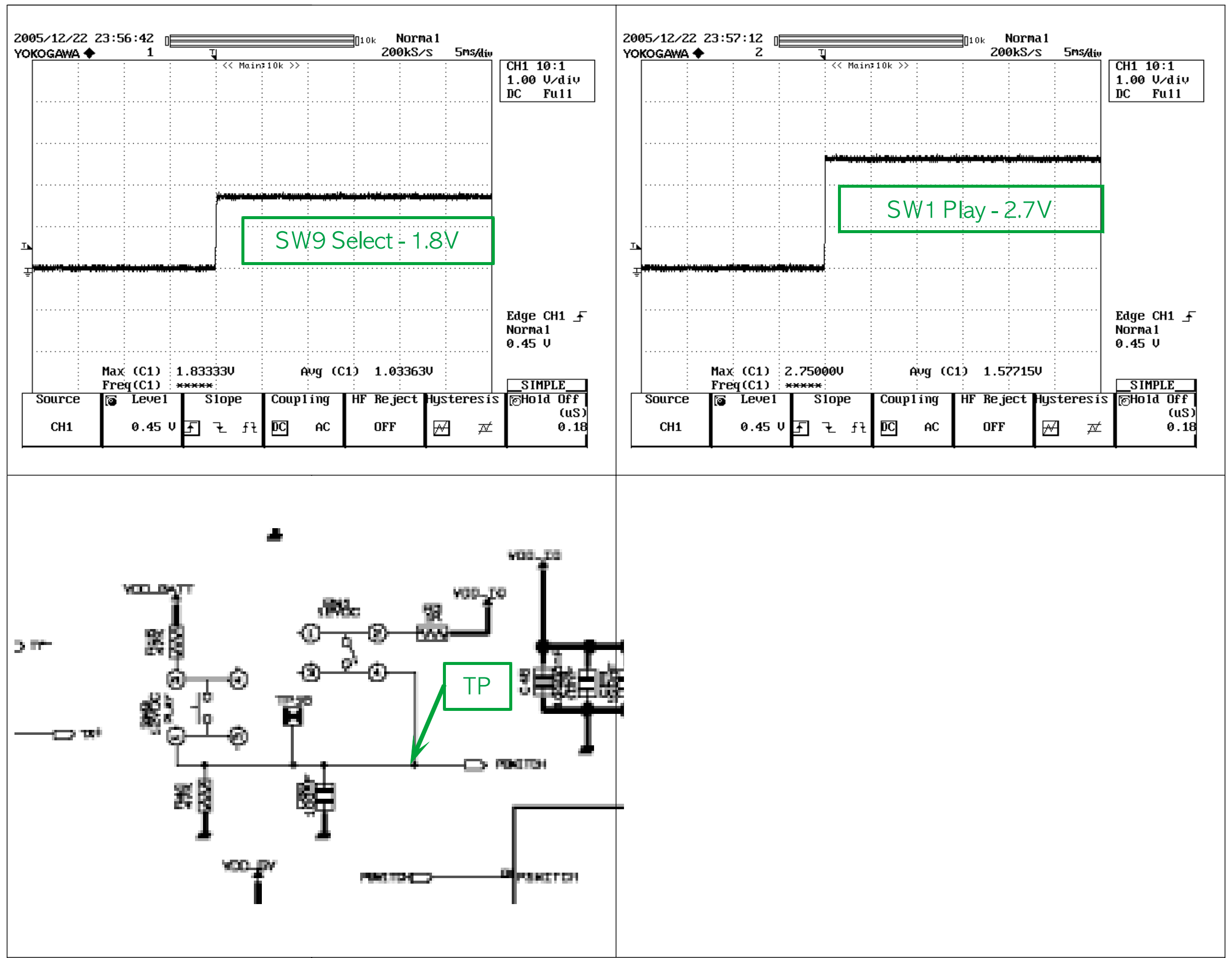
Test Point	Vin - C72	Test Point	Vout - C71
Output	Vin : Battery Level → 3.6V	**Output**	Vout - 3.6V

8. Switch Level (SW2,SW3,SW5,SW6,SW7)



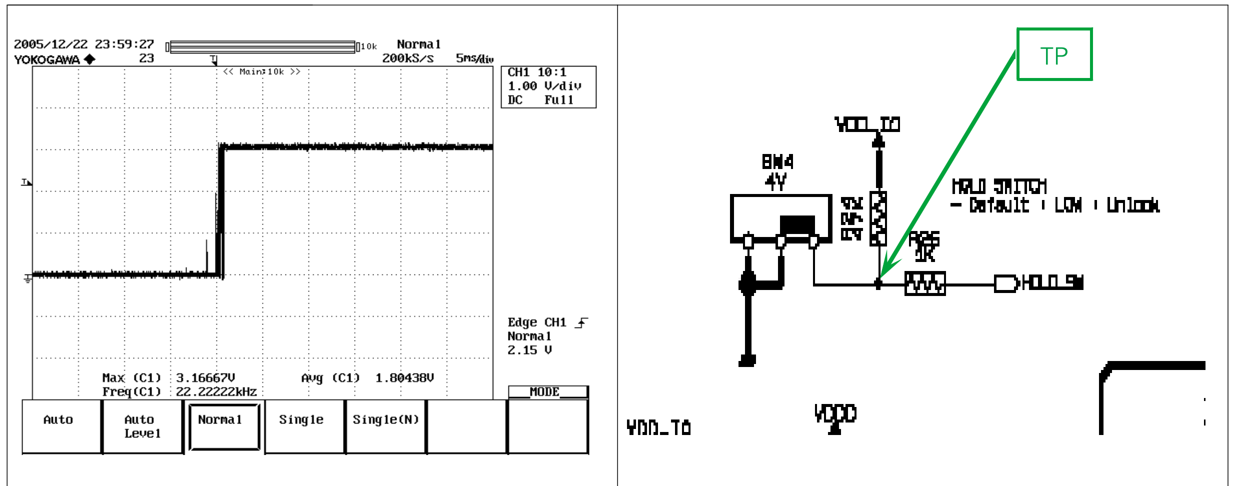
Test Point	Switch Level - TD2
Output	Switch Level : 3V → 2V, 1.7V, 1.2V, 0.8V, 0.4V

9. SW1,SW9 - Play, Select Key



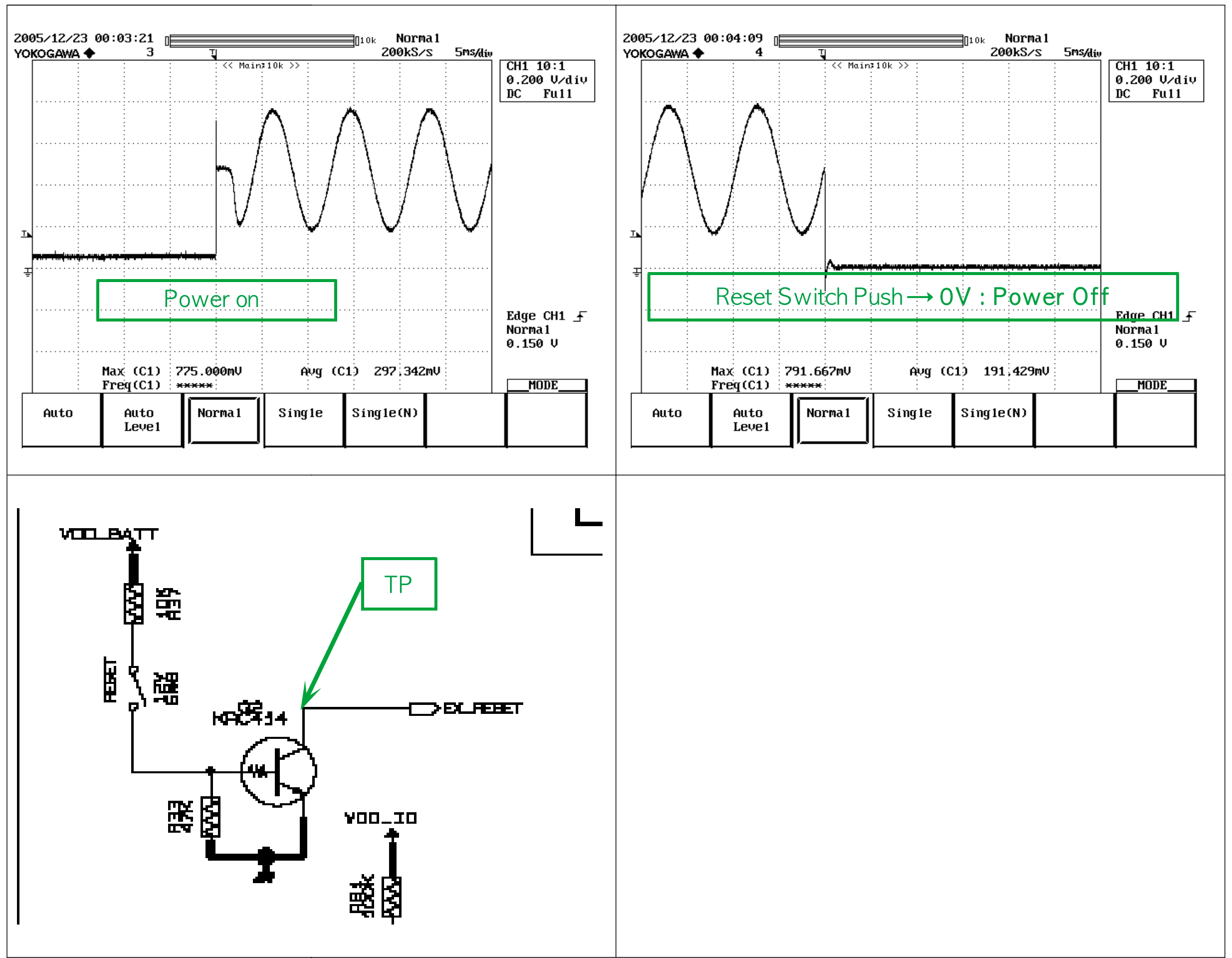
Test Point	SW1 : Select Key, SW9 : Play Key - C69
Output	SW1 : 0V-> 2.7V, SW9 : 0V-> 1.8V

10. SW4 - Hold Switch



Test Point	Hold Switch -R26
Output	Hold시 : 0V → 3V

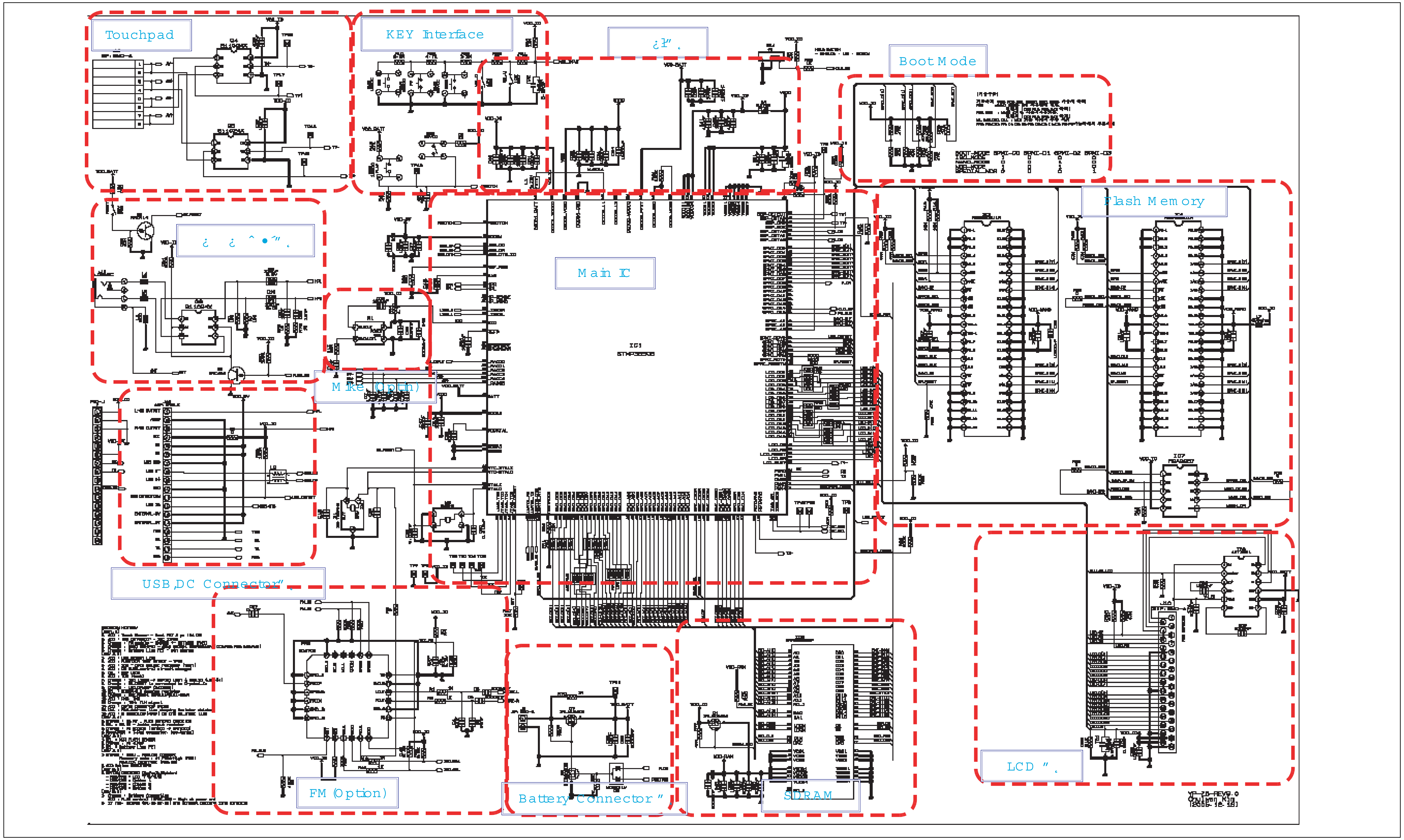
11. SW8 - Reset Switch



Test Point	SW8 : Hold Switch - Q2
Output	Power on : 0V → frequency, Reset Switch Push : frequency → 0V

1.Description of the Circuit

1-1. Main Blocks in the Circuit Diagram



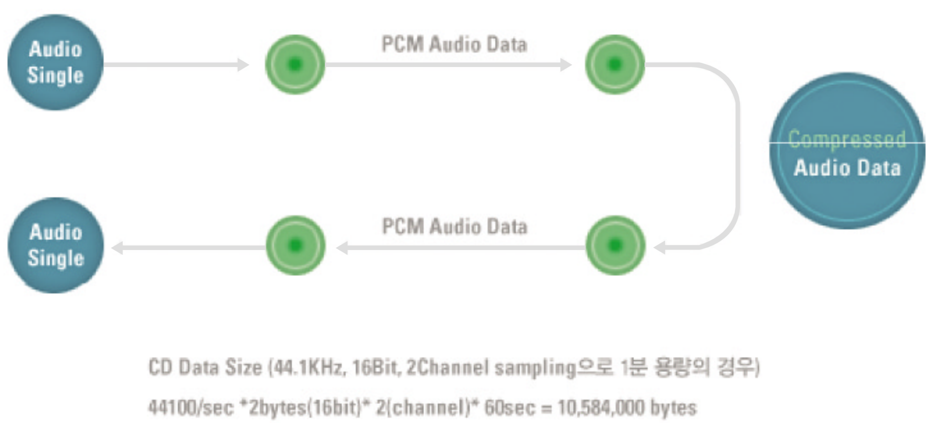
Circuit Board	Major Functions	Remarks
MAIN	1. Touchpad * Receives the touchpad input and forwards the input data to the Main IC. 2. Key Interface * Forwards signal from the keys to the Micom. 3. Power Block * Outputs voltage for internal use by converting the voltage from the battery through the DC/DC converter. 4. Audio Output Block * Turns audio output on or off 5. USB and DC Connector Block * Operates with USB or DC voltage (5V) and charges the battery. 6. Battery Connector Block * It operates and is charged with the battery voltage (3.7V). 7. SDRAM * High speed memory that plays the role of buffer between the memory and the Main IC. 8. LCD Block * Displays the data from the Micom. 9. Flash Memory Block * Saves data. 10. Main IC (STMP3650B) Circuit Block * Circuit Related to the Main IC Circuit MAIN	

14. Basic Information of MP3

1-1. Operating Principle of yepp

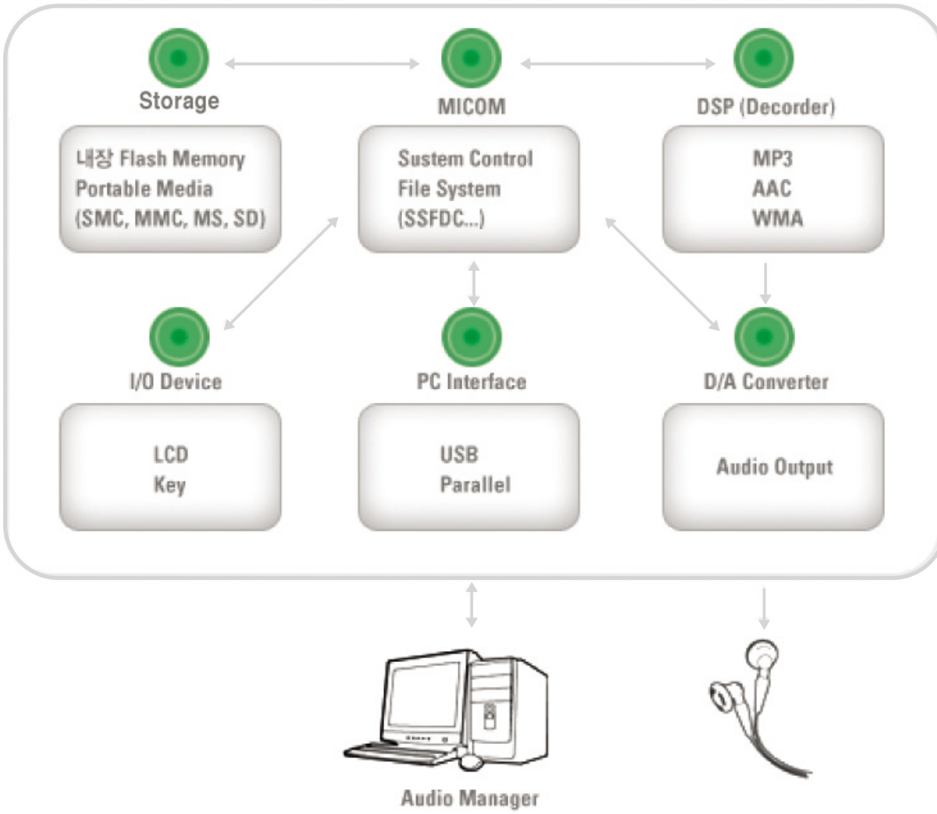
Terms and Overview

AV Conversion: process of converting Analog Data to Digital Data
SAMPLING RATE : means precision rate of A/D conversion and is indicated in Hz, bit number and channel number(for CD: 44.1 KHz, 16bit, 2channels)
ENCODING : process of compressing and converting digital data obtained through A/D conversion to audio format
Compression rate: indicated in bps(bit per second)
(For MP3: sound quality of CD level with compression rate of 128kbps)
ENCODING FORMAT : MP3 : MPEG Layer3
AAC : MPEG-2 AAC
WMA : Windows Media Audio (Microsoft)
ATRAC(3) : Adaptive TRansform Acoustic Coding (SONY)
EPAC : Enhanced Perceptual Audio Coder (Luscent Technology)
OGG : Ogg Vorbis
DECODING : Process of recovering the digital data encoded to the data before encoding
D/A : Process of converting Digital Data to Analog Data



Process of converting digital data to analog data

Yepp Block Diagram



yepp Block Diagram

Yepp Vocabulary

Yepp (Young Energetic Personal Passinate)

MP3 player that enables you to enjoy audio data like music file in existing CD in high quality by compressing it to 1/12 level without loss of quality using MPEG1 Layer3(audio compression technology of animation and sound compression technique). You can also use it for learning foreign language and Internet broadcasting.

MPEG

MPEG is an abbreviation of Moving Picture Expert Group and means specification defining the compression and de-compression type of animation by MPEG established in 1988.

MP3

MP3 means MPEG1 Layer3 and compression rate can be up to 96:1(phone) to 12:1(CD) depending on sound quality with compression coding technique of audio of MPEG technology.

(file extension: "mp3") That is, up to 150 pieces of songs can be recorded in one copy of CD with MP3 compression.

FLASH Memory

Flash memory is the memory chip where entered information will not be deleted even if the power is turned off while data is entered, and data can be freely entered or deleted.

Smart Media Card

Compact and light semiconductor media card in dimension of 45.1 x 37.1 x 0.76mm and weight of 2.0g. It is used as a storage of portable device and high quality media storage device of digital camera and music MP3 player.
Flash memory is embedded to store the data even if the power is turned off and it is a super-high speed product that can record up to 250 characters per second.(mass production of 8MB, 16MB, 32MB currently at Samsung Electronics)

OTP (Once Time Programmable)

OTP is one type of micro controller(MCU) and is the customer-oriented semi-conductor on which the customers can directly record the program. OTP type MCU is rapidly growing as its life cycle of set product and multi-kind/small quantity production system is introduced.

Since existing type of micro controller uses Mask ROM which cannot be played or recorded again, it requires over 5 months to develop set products, and it is not suitable for products with rapid change of product model.

Firmware

It is a program that controls and manages hardware. Firmware is distinguished from hardware in that it is a program but is distinguished from general applications in that it is closely related to hardware. In general, firmware is saved in ROM.

IP (Information Provider)

Company that provides information that users want through communication system with certain fee.

SecuMAX

As multimedia digital contents distributions become active in networks such as Internet and PC communication, copyright issue has appeared as an important topic. It is a system that can protect the right of copyright holders and enables the user to conveniently use contents. To receive service, member registration is required at digital contents service site adopting SecuMAX.

When completing member registration, customer ID, password and resident registration number will be registered at SecuMAX server and utilized as a basic data for performing user certification role. After registration, download the dedicated player and decryption key to use service.

Music drive developed by Samsung Electronics is embedded with SecuMAX decryption module.

Decryption key will be registered during installation of music drive. Music file downloaded from digital contents music service site with SecuMAX can be played back.

Yepp Explorer

This software controls yepp player in PC. You can move or delete music list or voice saved in yepp card or embedded memory. This software is required to use yepp.

Music Drive

Software audio player for PC embedded with MPEG II AAC Decoder first in Korea. It supports not only playback of MPEG audio format as well as SecuMAX, encryption protection system.

CD Ripper

MP3 compression software that converts CD music in PC to MP3 file.

OGG (Ogg Vorbis)

OGG(Ogg Vorbis) is featured to have ''higher compression rate than MP3', 'higher quality than MP3', 'no limit in use, distribution and development due to open source type. The biggest feature of Ogg Vorbis is that it has no limit in use of format itself.

The biggest feature that distinguishes Ogg Vorbis from existing music file is that it supports

VBR(Variable Bit Rate) by default.

Of course, MP3 also supports VBR format, but has effect of reducing capacity due to VBR based on existing MP3. Ogg Vorbis file supports VBR by default and helps you enjoy high quality music without loss due to big width of bit rate.

1-2. MP3 Overview

MP3 is one of file extension like .hwp, .wav, .txt used in computer.

Exactly, it is the abbreviation of MPEG Audio Layer-3.

Origin of MP3

MPEG is Motion Pictures Expert Group and is a standard made by experts in this area under international standard organization like ISO(International Standard Organization) and IEC(International Electric Committee). It is technical standard of compressing and transmitting video and audio signals and recovering them again.

The first specification that MPEG made is MPEG-1 in 1988. It is the technology used to produce video CD. MP3 means the audio compression part among specification of MPEG-1(1995). MPEG-2 is used together with MPEG-1. AAC(Advanced Audio Coding or MP4) receives attention with its excellent digital audio and is derived from MPEG-2. MPEG-4(lastests standard on movie compression for conference communication) is being established.

MP3 is most widely used and called "MPEG Audio Layer-3", which is version up from Layer-1 and Layer-2. In general, it is called MP3 since Layer-1 has compression rate of 1:4, Layer-2 of 1:61:8, Layer-3 of 1:101:12.

Using MP3 technology, up to 100 songs(7 hours) can be contained in one copy of empty CD of 650MB.

Transition of Portable Player



Transition of Portable Player

MP3

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WMA (Windows Media Audio)

Multimedia compression type of Microsoft. Only music data is compressed from "WMT". Streaming and file format also support this data. In a same quality as MP3, it is about 1/2 size and contains Windows Media Rights Manager with copyright protection technology. It can be played back with [Media Player] provided in Windows98.

ATRAC3

Sound compression type of MD and latest specification of [ATRAC (Adaptive TRansform Acoustic Coding)] developed by SONY. Has about 2 compression rate than existing ATRAC.

Real Audio G2

Format type developed by Real Network. High quality can be obtained at low transmission speed of 16Kbps-32Kbps using [RealAUDIO G2 Music Codec] as compression type. Since streaming play in Internet radio is the main purpose, file does not contain copyright protection technology. "Real Player G2" supports MP3 playback and "Real Juke Box" supports encoding from CD to MP3.

Tips

How MP3 can produce same quality as CD?

Ears of human can listen to signal in the range of 20Hz~20KHz. It is called "audible frequency". To convey the audible sound in digital type CD, sampling frequency of 44.1KHz, about 2 times of audible frequency, should be used. It is the task of dividing sound signal to 44,100 pieces per second and making the signal to digital format of 0 and 1. How delicately the sample can be expressed will be determined by number of bit per sample. Audio CD is 16 bit. It means that 1 sample can be expressed in 65,536(16 square of 2) stage.

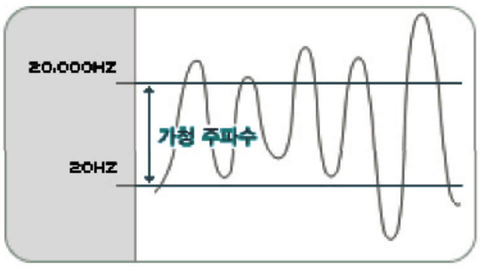


Fig. 1 Sound Wave before Loss Compression

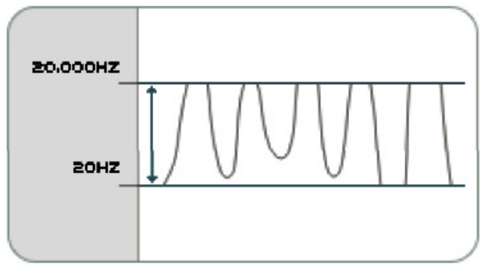
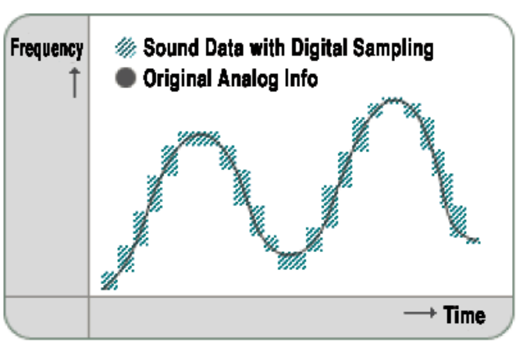


Fig. 2 Sound Wave after Loss Compression

When converting CD music to WAV file, the capacity is about 40MB(for 4 minutes). By converting it to MP3, it reduces to 4MB since "loss compression", the feature of MP3, is used. Loss compression type removes the sound beyond the range of audible frequency(20Hz~20KHz). It uses the features that small sound cannot be heard after very strong sound. <Figure 1> is the sound wave before loss compression. It can be regarded as the sound wave of music CD or cassette tape containing sound people cannot listen. When it is made into MP3, it is as shown in <Fig.2>.

Volume Control



Capacity can be reduced much by adjusting the degree of loss. However, it causes deterioration of sound quality. Music CD contains sound made with 16 bit 44.1KHz of stereo sampling. Stereo is the type of dividing the sound into left and right. CD should change analog

sound to digital.

Digital information is cut between sections and location information is saved in each section. "Sampling rate" is the standard of how many sub-section it will divide 1section. Divided frequency part is called 8 bit and 16 bit. 8 bit sampling means that frequency is divided into 2 stage, that is, sound pitch of 256 stage. 16 bit sampling divides into 65,536 sound pitch. In addition, 44.1KHz means sampling of 44,100 times per second. To reduce the amount of information made at digital, sampling bit number and frequency should be set low, but it will cause deterioration of sound quality. There is no difference in sound quality between MP3 and CD since encoding(converting CD track to MP3) is done with 44.1KHz at 16 bit. Better CD sound quality cannot be obtained by lowering the sampling rate, but the capacity can be reduced.

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1-4. Type of Storage

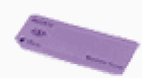
MP3 is regarded as MP3.

Let's examine what are the types of storages currently used.

Optical Disc : CD, MD Player / Flash Memory : MP3 Player, Digital audio player

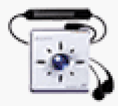
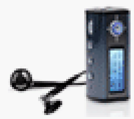
Type of Digital audio player storage.

Audio Format Table

	 SD	 MMC	 Smart Media	 Memory Stick
Source	Matsushita, Toshiba, SanDisk	SanDisk Hitachi	Samsung Toshiba	Sony
Size(mm)	32 x 24 x 2.1	32 x 24 x 1.4	45 x 37 x 0.76	21.5 x 50 x 2.8
Weight(gram)	2.5	1.5	2	4
Pin Count	9 (7of MIMC + 2 I/O)	7	22	10
ESD (Contact/air)	±10K/±15K V	–	±4K/±8K V	–
SDMICompliance	Phase 1 & 2	Phase 1	Phase 1	Phase 1 & 2
Security	Challenge & Response	Unique ID	Unique ID	Encryption Logic
Density	'00 : 32MB, 64MB '01 : 256MB	'00 : 32MB, 64MB	'99 : 32MB, 64MB '01 : 128MB	'00 : 32MB, 64MB '01 : 128MB
Licensing	Required	Open Standard	Open Standard	Required

* SSFDC (Solid State Floppy Disc Card) File System
* Standard file system for support of SMC's compatibility(DOS/FAT adopted)

Small Form - factor Cards Comparison

Item	 CD Player	 MD Player	 MP3 Player	 MP3-CDP
Audio Format	PCM	ATRAC	MP3, AAC, WMA...	MP3, WMA, Audio-CD
Audio Data compression	X	5:1	Various compression rate	Various compression rate
Storage	Optical Disc	Optical Disc	Flash Memory	Flash Memory
Basic function	Audio play	Audio play	Audio play	Audio play
Additional function	X	X	Voice recording, play phonebook FM Radio	Multi codec support Multi–functional LCD Remote controller, FM Radio
PC S/W	X	X	Audio Manager Ripper	Audio Manager Ripper

1-5. Copyright

Various kinds of methods are combined to unify technical specification to prevent digital music data from illegal reproduction. Let's examine groups and vocabularies related to copyright.

SDMI (Secure Digital Music Initiative)

Internet music record company consortium to pursue development of digital music file format. World-class music makers and related groups are formed to protect copyright of music and to prevent illegal reproduction.
-PD : Portable Device
-PM : Portable Media (SMC,MMC,MS,SD Card)
-UID : All PD, PM should have unique ID.
-Binding : All Digital Audio should be bounded to PD or PM.

DRM (Digital Rights Management)

Manage interests of persons related to copyright that occurs due to use of digital contents protected from illegal use of digital contents through various channels.

WaterMarking

Technology of inserting the specific data to claim copyright of multimedia contents so that eyes and ears of human cannot be distinguished.

SecuMAX

Digital Security Total Solution adopting Snake encoding algorithm.
Version1.0 contents in service in Korea (M4you.com, etc.)
SDMI compliant vrsion2.0 development completed

Reproduction Prevention System

Reopening of MP3 music service.
Lots of dispute have occurred in network due to copyright.
However, as online MP3 sales have resolved, the number of legal Internet site has increased.
However, reproduction prevention system is required for legal sales. All Internet sites serving Korean song in MP3 are introducing reproduction prevention system.

Meaning of SecuMAX System Application

Most legal Internet MP3 service sites adopt SecuMAX and YEPP of Samsung and several companies have hardware supporting SecuMAX among MP3 players currently distributed. Then, user needs to receive MP3 applied with SecuMAX to receive legal service. It is required to have program that can play back MP3 applied with SecuMAX technology in MP3 player. For example, since YEPP supports SecuMAX, it can play back, but it means that you cannot play back this at the players of other companies that do not support SecuMAX.

At present, organization has been formed for standardization of reproduction prevention system in foreign countries. Samsung Electronics has also participated in this standard using SecuMAX and completed development of SecuMAX 2.0 with world compatibility.

SecuMAX

SecuMAX is the reproduction prevention system that is made for protection of copyright in rapidly growing distribution of digital contents.

Reopening of MP3 Music Service

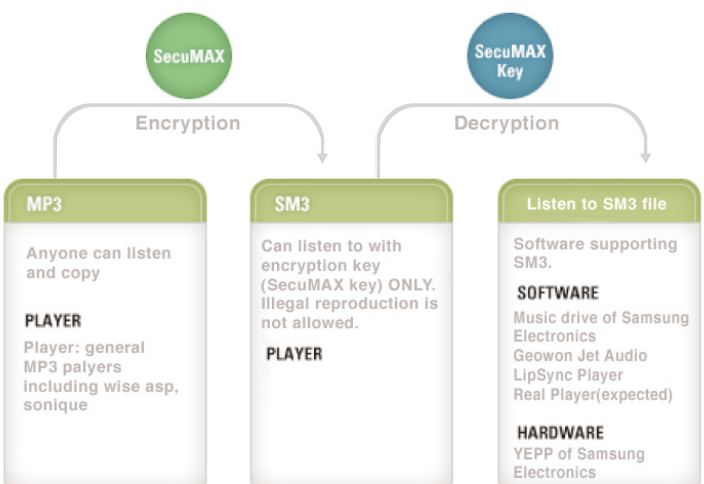
-Digital contents copyright protection and management service.

-Fundamentally prevent the illegal distribution

Only legal users can play back music

Dedicated software required(ex.Samsung Electronics, Music Dreve)

Prevention of usual illegal use such as file transfer, CD-R Copy and hardware reproduction.



-Report for copyright holder

Basic data for collection of copyright fee and near copyright fee

Track sales of all publications through Internet, PC communication or 3rd path.

Provide sales information per IP, song and hour real time.

-Can serve any type of files

-Can applied to Internet and PC communication equally

-Can provide copyright protection service for hardware at the same time.